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COMPUTERWORLD

INSIDE

In Depth — Battle of the operating environments: Unix vs. SAA. Page 99.

IBM-Fujitsu software pact: One year later, the acrimony remains, but progress is being made. Page 4.

PC cloners take bus to New York this week in an effort to thwart Micro Channel strategy. Page 6.

Still alive and kicking, IBM's 9370 line is set for a mid-life booster this week. Page 7.

Section 1706 should live at least another year; Senate committee rejects effort to ease tax requirements on independent contractors. Page 145.

Don't let the boss read about strategic systems of the future. He's liable to clip this story and ask what you're doing about it. Page 107.

Computer Sciences acquires management skills, buying up the Index Group consulting firm. Page 16.

In this issue

The companies investing most effectively in information systems.

COMPUTERWORLD
PREMIER
100

DEC soiree to feature net scheme

BY ELISABETH HORWITT
CW STAFF

Digital Equipment Corp. will enter the lists against IBM in the network management standard sweepstakes this week when it announces a long-awaited Enterprise Management Architecture at its Decworld conference, a company spokesman told *Computerworld* last week.

EMA, which DEC plans to announce tomorrow at Decworld in Cannes, France, represents the firm's "major commitment to management of the enterprise," according to David Korf, DEC's director of network management marketing.

However, an industry observer questioned whether DEC will be any more successful than IBM in luring other computer vendors under its management umbrella.

The architecture was designed to go beyond traditional management functions such as fault and performance monitoring of data networks and to pro-

Continued on page 8

OS/2 Extended in user trials

Businesses look to IBM operating system to distribute applications load

BY DOUGLAS BARNEY
CW STAFF

After months of scrutiny, a sprinkling of America's largest firms have given IBM's OS/2 Extended Edition the go-ahead, according to early users interviewed by *Computerworld.*

It has not been an easy haul for IBM. Confusion, rising memory prices, lack of full multiuser capabilities and other product shortcomings have led many to shun IBM's proprietary database and communications extensions to OS/2. IBM also still considers OS/2 Extended to be systems software, which cannot truly take off until key applications are available.

But these stumbling blocks have not stopped Blue-tinted firms such as Security Pacific Automation Co., Amoco Corp. and Bank of America National Trust & Savings Association from developing specific, and in some cases highly ambitious, strategies.

If all goes according to plan, OS/2 Extended will affect some 18,000 personal computer systems at Bank of America in California alone. The bank has nearly completed the first year of a massive three-year automation project called the Customer On-Line Information Network, or COIN, in which OS/2 Extended is expected to play a major role.

Gradual implementation

The initial phase of the project, which provides a new hardware and software system for tellers and branch back offices, will be based on Microsoft Corp's MS-DOS. But according to the current plan, in the next eight months OS/2 Extended will be phased in, said Christo Skeados, vice-president of Bank of America.

Unlike some firms that see the integration of database management systems and communications as a key selling point, Skeados is almost entirely concerned with the communications capabilities.

Continued on page 14

Lotus: 'Oh, yeah. Get a 286'

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — Sometimes it pays to read the fine print. For users considering an upgrade to Lotus Development Corp.'s 1-2-3 Release 3.0, tiny print at the bottom of a recent ad reveals what many had suspected: In order to get adequate performance, ditch that PC XT-class machine.

Until the advertisement appeared last week, Lotus officials had maintained that all a user needed to run Release 3.0 would be 640K bytes of random-access memory and a hard disk drive. This was expected to be a key selling point over Microsoft Corp.'s Excel, which requires a high-end processor and expensive graphics.

The revelation that an Intel Corp. 80286 or higher processor is needed for satisfactory performance cuts the cost gap between implementing Excel and 1-2-3. It is technically possible to run Release 3.0 on an IBM Personal Computer XT-class machine, but like Microsoft's Windows, it may be a dog. The news also prompted a wave of questions

Continued on page 145

COMPUTERWORLD JOB SATISFACTION SURVEY

MIS pros a restless but happy crew

BY DAVID A. LUDLUM
CW STAFF

Inside

- Detailed charts appear on pages 108 and 109.

With their notoriously high turnover rate, MIS managers and professionals might be considered the business world's rolling stones. However, in general, they get satisfaction from their work, according to *Computerworld*'s second annual Job Satisfaction Survey.

Most of the more than 900 managers and professionals who responded to the survey say they are frustrated by some aspect of their position. The leading concerns reflect hazards endemic to MIS, such as a lack of understanding on the part of top management, obstacles to career advancement and a high-pressure atmosphere.

The respondents have been with their current employers an average of six years, which equates with an annual turnover rate of 17% — about twice the average for business managers and professionals. But the survey suggests that much of the turnover is in response to widespread opportunities in MIS rather than dissatisfaction.

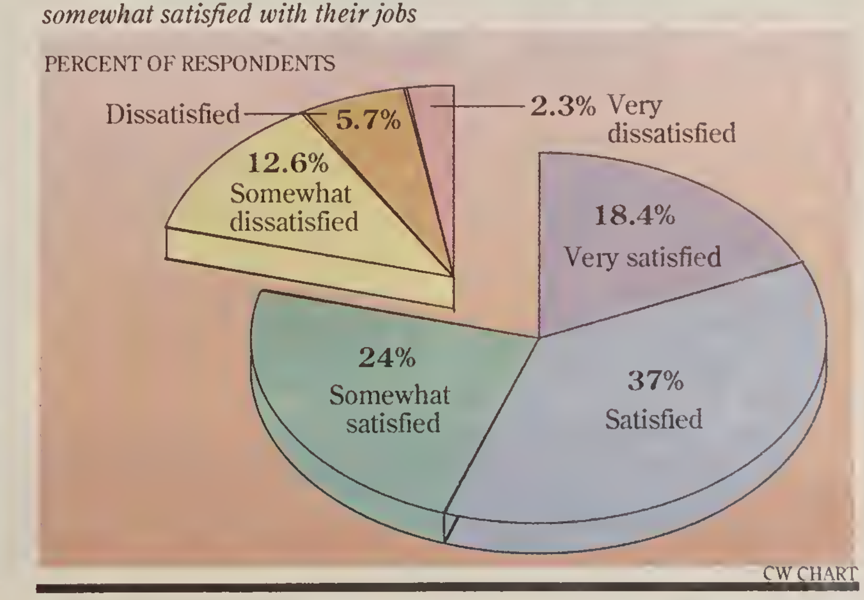
More than half the respondents — 55% — say they are satisfied or very satisfied with their current position, and 24% indicate that they are somewhat satisfied (see chart below). In responding to statements about MIS, 81% of them agree that MIS is an exciting vocation (see chart page 109).

Larry Canup, a systems support manager at St. Joseph Medical Center in Wichita, Kan., says MIS affords him an opportunity not only to travel but to push his career further than another field might allow, given his lack of a

Continued on page 108

How satisfied are you?

Of 900 respondents to the question, 79.4% say they are at least somewhat satisfied with their jobs



CW CHART

NEWSPAPER

SECOND CLASS MAIL

IN THIS ISSUE

Bus deriders. Nine Personal Computer-compatible vendors go to work on an AT-style challenge to the IBM Micro Channel bus. Page 6.

PC surprises. Apple will gainsay CEO's statements by rolling out Mac II with Motorola CPU; Compaq's restyling announcement will leave laptop lovers unrequited. Page 6.

NEWS

4 Despite layoffs, AT&T's Allen is encouraged by revenue growth, thawing OSF relations.

4 Fujitsu, IBM perpetuate marketplace and arbitration grudge matches.

6 X/Open announces a branding program to identify compliant systems.

7 IBM will trot out new 9370 models to give the line a little kick.

7 An RPG compiler from IBM will bring System/36 applications to the PS/2.

8 Opening gavel falls on 1-2-3 vs. Visicalc trial.

10 Apple, DEC promote groupware as they throw in with Odesta's Document Management System.

10 3Com introduces tools for 3+ to 3+Open migration.

15 Unixmeisters beware — IBM has licensed Apollo's NCS for its AIX systems.

16 Data transfer software loosens clog in DEC-IBM host pipeline.

16 CSC goes more commercial, buying management consulting firm Index Group.

145 Token turtles triumph: Users' preference for 4M-bit token-ring speeds stymies vendors' push for 16M-bit technology.

SYSTEMS & SOFTWARE

23 ADAPSO says portability can mean the difference between life and death.

23 Audit finds fault with Oracle benchmark results.

23 Tool converts System/36 code to PC parameters.

It's your move: Unix or SAA? Page 99.

MICROCOMPUTING

43 Xerox fortifies Ventura Publisher.

43 Preventive medicine for PC viral attacks.

43 High-tech gear crews for New Zealand America's Cup challenge.

NETWORKING

77 Technology center's director will instruct businesses on network management.

77 Japan steelmaker to market technique for AI tool development.

77 Stress seen as negative factor in communications management productivity.

MANAGEMENT

107 Businesses scout out strategic systems opportunities for the future.

107 New York Life injects healthy dose of business into its technology divisions.

107 Women in MIS face advancement barriers, authors say.

Quotable

"They are as contentious as ever."

JOHN L. JONES
ARBITRATOR FOR
IBM-FUJITSU
SOURCE-CODE BATTLE

On the one-year anniversary of the settlement. See story page 4.

COMPUTER INDUSTRY

115 Arthur Andersen's worldwide reach benefits its MIS consulting.

115 DCA plans to buy back $25 million in stock to stabilize share price slide.

115 Excelan appears to be suffering growing pains as strife prompts management turnover speculation.

COMPUTER CAREERS

124 Utilities offer more spark than ever, thanks to cost controls and higher tech.

TRAINING

141 Dial-up computer-based training is not completely disconnected.

TRENDS

146 Mac report: Analysts say desktop publishing king is on its way to conquering other fiefdoms.

IN DEPTH

99 Unix offers more — now — than SAA may ever be able to provide. By George Schussel.

OPINION & ANALYSIS

19 Kutnick cautions users to question OSI compatibility claims.

23 Hamilton sorts through the proliferation of AS/400 opinion.

43 Barney finds that Lotus takes its lickings but keeps on ticking.

77 Leong reaches out and touches someone at the telephone company.

107 Ferruggia gives poor marks to formula job appraisals.

115 Wilder wonders about all the Lotus-bashing.

DEPARTMENTS

8 News Shorts

18 Editorial

136 Marketplace

144 Stocks

146 Inside Lines

PCs survive scorcher

Classroom floors, turtles and fish not so lucky

BY JEAN S. BOZMAN
CW STAFF

CLEARWATER, Fla. — Twenty Apple Computer, Inc. machines were the sole survivors of a man-made heat wave at Lakewood High School here that devastated the animal and plant life in the Pinellas County school's science wing.

The trouble began Sept. 2, when construction workers turned the heat up to 120 degrees Fahrenheit to dry out mold-covered walls during the Labor Day weekend. All the science-area windows are permanently sealed against the Florida humidity, and the school's unreliable air-conditioning system had been turned off.

Three days of 120-degree heat killed schoolroom turtles and fish, buckled floor tiles and reduced a piece of fruit to pie filling.

Strangely, the mold survived — and so did the Apple IIE and IIC computers, which are only rated to operate in heat up to 104 degrees.

"I booted them up personally," said Rich Litzenburger, group leader of the school system's computer maintenance unit, "and there were no problems while we ran diagnostic programs on them." High heat can crack semiconductor chips, disrupting circuits embedded in their silicon layers.

The computers are used for student tutorials, word processing and color displays of complex subjects such as water and air pollution, said Lita Weingart, a biology teacher at the school. Although she has not tried all the data files, she said it so far looks as if the Apples are ready to take another licking at the hands of keyboard-pounding students at the 3,000-student school.

Some teaching aids were not so lucky. "I used to have a living classroom with eight aquariums, two 50-gallon terrariums and tropical plants," Weingart said. "But as soon as I opened the door and was hit by the heat, I knew there was no hope for the animals." The thermometer in a lifeless fish tank registered 130 degrees. Even the cactus collection shriveled.

Generator rescues chain stores from disaster

BY J. A. SAVAGE
CW STAFF

SEATTLE — When the lights went out in downtown Seattle for five days, Charles Mitchell, data processing manager at Nordstrom, Inc.'s department stores, did what many rugged Northwesterners do when a storm hits — he fired up a generator.

Although he was dressed in a suit and tie instead of a flannel shirt and mud-caked boots, Mitchell's reaction was much the same as that of his more rural neighbors when faced with infrequent, but not unexpected, blackouts. But since he had never tried this method before, he also sent 12 of his 160-person staff to a Comdisco, Inc. hot site in San Ramon, Calif.

"It was a two-pronged attack. But by the time they got [to the hot site], the generator was going," Mitchell said. Getting the generator on-line took about four hours, and the shop was without power for a total of 15 hours starting at 11 a.m. on Aug. 31.

The blacked-out days, from Aug. 31 to Sept. 5, were critical back-to-school shopping days for the customers of the department store. Most critical, according to Mitchell, was the store's payroll.

Mitchell said the Nordstrom data center, which processes on-line credit transactions and billing as well as financial services for about 50 outlets, was able to continue operations without major setbacks. The stores continued to sell, relying on in-store processors and cassette backup.

Nordstrom subscribes to a subset of disaster services from Comdisco, including the option of using the company's site during a power outage. "We hadn't tested that one before. Now we know it can work," Mitchell said. Despite being able to fend for himself this time, Mitchell said he will retain the disaster services in case the phone system goes out, the data center becomes unusable or one store's system goes down.

EDITOR'S NOTE

The worksheet on page 80 of this week's *Computerworld Premier 100* supplement contains errors that may result in an incorrect total. *Computerworld* will reprint the corrected worksheet in its entirety in next week's issue.

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AT&T shifting 3,000 to sales

Giant seeks to add revenue-producing jobs in constricting market

BY NELL MARGOLIS
CW STAFF

BOSTON — Speaking before a group of security analysts here last week only hours after news broke of AT&T's plans to lop 6,000 jobs from its Network Operations Group, Chairman Robert E. Allen conceded that the company has "lost some ground" in its cost-cutting program and vowed that "we cannot and will not tolerate a return to rising costs."

Some 3,000 of the potentially unseated long-distance staffers are being redeployed in sales jobs, Allen said. Since the company will not move to fill most of the administrative positions, he said, "the overall effect is more people in revenue-producing sales jobs and fewer in expense-producing administrative jobs." He called the move "a different kind of 'double leverage.' "

Gautam Kapoor, an analyst at Pyramid Research, Inc. in Boston, called the move smart. With AT&T's long-distance business increasingly pressured by competition, he noted, "it's going to be a lot harder for them to maintain market share unless they can get their cost down."

No less imperative, Kapoor said, is the manner in which the shift — an all-out effort to avoid outright layoffs, according to an AT&T spokesman — is being undertaken. A layoff at AT&T several years ago "was effective in reducing costs but not ideal in terms of morale or the perception of the company that was generated," Kapoor added.

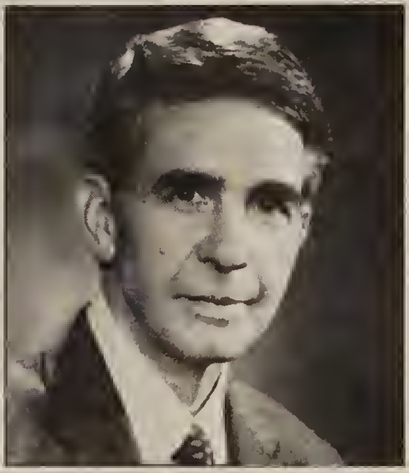
No satisfaction

"If I had to sum up AT&T's progress in one sentence," Allen said, "I'd say I'm encouraged but not satisfied." On the encouraging side, he emphasized revenue growth — particularly from product sales across all product lines — increasing international presence and the promise of long-distance regulation reform as indicated by the Federal Communications Commission's price cap proposal.

In addition, Allen indicated that the industry may be about to see a resolution of the current conflict between AT&T and the rival companies that make up the Open Software Foundation as to which flavor of Unix will become an industry standard. In addition, he said, "we see the computer industry moving toward agreement on some version of our own Unix operating system as an industry standard."

Citing ongoing discussions between AT&T and "the OSF leadership" as the basis for circumspection, Allen declined to say exactly what factors gave rise to his optimism on AT&T's Unix emerging triumphant. However, he twice alluded to the prospect and said, "I hope we'll have something to tell you in the not-too-distant future."

In related news, Sun Microsystems, Inc. last week announced its intent to sell $42 million worth of its common stock to AT&T. The sale, expected to go through within the next 30 days, will mark the second stock purchase under a January agreement pursuant to which AT&T can acquire up to 20% of the workstation market leader by January 1991.



"WE SEE THE computer industry moving toward agreement on some version of our own Unix operating system as a standard."

ROBERT E. ALLEN
AT&T

IBM, Fujitsu lock horns in market, boardroom

BY CLINTON WILDER
CW STAFF

One year after a historic arbitration ruling granted Fujitsu Ltd. access to IBM source code, the two technology titans are more fiercely competitive than ever — in the marketplace and at the arbitration table.

Fujitsu agreed last week to distribute high-end IBM-compatible Amdahl Corp. mainframes in Japan for the first time. Analysts said the long-rumored move was in direct response to IBM Japan's aggressive wooing of Fujitsu users in Japan.

Meanwhile, as arbitrators try to hammer out the complex rules for Fujitsu to view IBM source code in a highly controlled environment, representatives of the two firms continue to battle over every point.

Standoff

"They are as contentious as ever," said John L. Jones, a retired Norfolk Southern Corp. MIS executive who is arbitrating the case with Stanford University law professor Robert Mnookin. "They're two very vigorous competitors, and they don't give an inch. But if that weren't the case, they wouldn't need the arbitrators."

Amdahl confirmed last week that Fujitsu will begin selling a small number of Amdahl's 5990 Model 700 and 1400 high-end mainframes to selected Japanese customers in the next three to six months. An Amdahl spokesman said Fujitsu's goal is to sell 30 CPUs in three years.

Arbitrator Jones

The limited number suggests that the move is a rearguard action to keep Fujitsu customers desiring IBM compatibility in the Fujitsu-Amdahl fold. Fujitsu mainframes are not IBM plug-compatible, but Amdahl's are.

Selling an Amdahl CPU in Japan "would always be a second choice for Fujitsu," said Bob Djurdjevic, president of Phoenix-based Annex Research. "But if they're going to lose a dollar to an IBM-compatible sale, they might as well get 50 cents out of it."

Late last year, IBM Japan began offering Fujitsu customers a protocol conversion program to support Fujitsu applications on IBM mainframes running MVS/XA [CW, Nov. 23, 1987]. Fujitsu has struck back by modifying its long-standing agreement that Amdahl, which is 46% owned by Fujitsu, would not sell its U.S.-label machines in Japan.

Analysts differed on whether that decision might affect Fujitsu's need to pay IBM a yet-to-be-determined license fee for access to IBM source code in a so-called secured facility, which will be controlled by the arbitrators until 2002.

Arbitrators established the arrangement to replace 1983 agreements between IBM and Fujitsu, which had collapsed under IBM's charges that Fujitsu's OSIV/F4 MSP operating system stole trade secrets from MVS/XA, among other things. The arbitration ruling granted Fujitsu the chance to develop IBM-compatible operating systems with immunity from IBM litigation.

"I'd suspect that Fujitsu would no longer want that [IBM] code," said Joseph Payne at Alex Brown & Sons, Inc. in Baltimore. "Amdahl can supply MVS/XA and eventually ESA. Fujitsu can put the whole [arbitration settlement] in the round file."

But Donald Young, who follows IBM for Sanford C. Bernstein & Co., said Fujitsu still has a longer term concern about staying current with future IBM operating systems. He said the Amdahl distribution in Japan should not affect the IBM source-code agreement.

Fujitsu and Amdahl management also moved closer together last week as Fujitsu U.S. subsidiary Fujitsu Microelectronics, Inc. selected Amdahl Vice-Chairman Eugene R. White as the first non-Fujitsu member of its board of directors.

Jones said the arbitrators will announce the rules and the financial terms of Fujitsu's source-code access before the end of the year. Rules for use of the secured facility — in effect a software clean room where Fujitsu may view pieces of IBM source code — have been completed, Jones said. The arbitrators are now seeking to establish how much Fujitsu will pay for both current IBM software and access to successor programs.

ARBITRATORS are seeking to establish how much Fujitsu will pay for current IBM software and access to successors.

Since the Sept. 15, 1987, ruling, Jones said many have misinterpreted Fujitsu's rights under the settlement. "We make no guarantees that Fujitsu can develop compatible software, only that they will have a reasonable opportunity," he said. "There will be strong rules and security to make sure IBM's rights are protected and that they will be compensated. Fujitsu can't just walk out of the facility and go sit down and write code."

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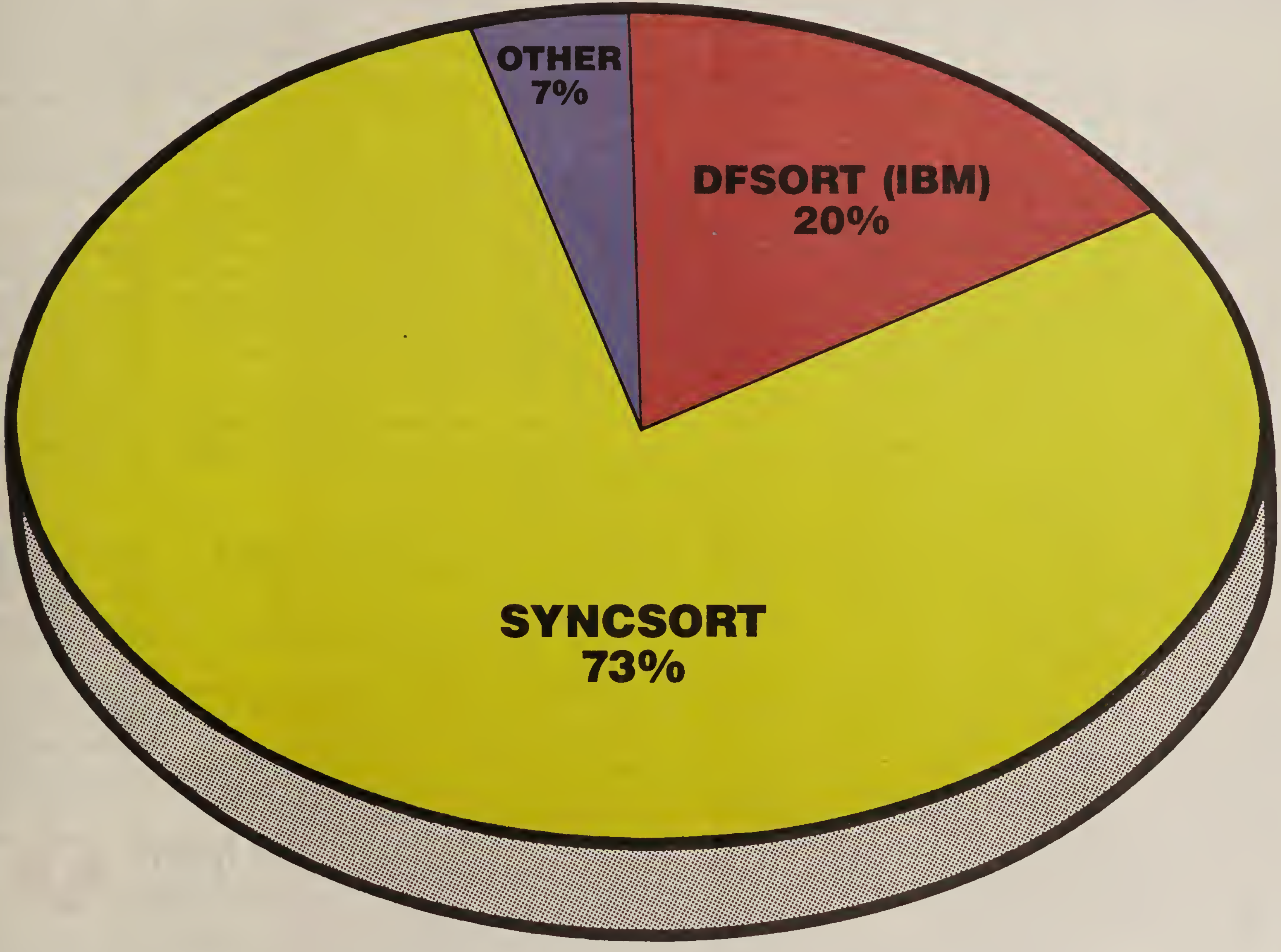

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Group aims to make 32-bit AT-type bus

Compatible makers challenge Micro Channel

BY ALAN J. RYAN
CW STAFF

NEW YORK — When nine IBM PC-compatible vendors meet here tomorrow, they will throw down the gauntlet to challenge IBM's Micro Channel bus with their own IBM Personal Computer AT-style bus alternative.

In a United Nations-like effort, the vendors have formed a consortium to create a new bus standard based on a 32-bit AT-style bus, sources said.

Collectively, the PC vendors that make up the consortium account for 43% of the PC-compatible units sold in the U.S. market, according to Bruce Stephen, senior PC analyst at International Data Corp. in Framingham, Mass.

The 32-bit bus, which would give the AT bus the power to work more efficiently with Intel Corp.'s 80386 microprocessor, is not a new concept, however.

Two years ago, Phoenix Technologies Ltd. in Norwood, Mass., called together an ad hoc committee to consider creating a standard based on a 32-bit AT bus through the PC/ET, or Personal Computer Extended Technology committee. At that time, approximately 60 computer companies had joined the committee.

However, without the support of IBM or Compaq Computer Corp., those efforts slowed down and grew into the IEEE P996 standards group. A year later, IBM announced the Micro Channel Architecture.

Critical mass?

Now Compaq and other major PC industry players — including Hewlett-Packard Co., Tandy Corp., Epson America, Inc., NEC Corp., Ing C. Olivetti & Co., Wyse Technology, Zenith Data Systems and AST Research, Inc. — are involved with the alternative bus, which will be similar to that specified in the IEEE P996 standards. A product is expected to develop out of those efforts next year.

Companies supporting the consortium's efforts extend beyond PC manufacturers to include Phoenix Technologies, Intel and Microsoft Corp., sources said. Most of the companies involved have signed nondisclosure statements, according to company spokesmen.

However, in not-for-attribution comments, some of those involved said the new bus will be a boon to users, eliminating the need to have both the Micro Channel and classic AT standards within the same company.

"With the Micro Channel, the user has two sets of interfaces, two sets of cards and two sets of software," one source said. The new bus would eliminate the need for duplication that the Micro Channel creates, he said.

Bob Puette, general manager of the PC group at HP, said that like other companies, HP's engineers have been studying the Micro Channel.

"Our engineers determined that we can have most of the kinds of capabilities you can get in the Micro Channel" by extending the current bus while also giving users full backward compatibility, Puette said.

But while the vendors involved in the consortium are enthusiastic, other industry observers remain skeptical.

Carl Warren, principal engineer at Warren Group Labs in Torrance, Calif., said the Extended Industry Standard Architecture (EISA) — which he claimed is what Compaq will call the new bus — will serve as a technology bridge but will have a clock speed of 35 to 40 MHz. That speed will be unacceptable for Intel's future 33-MHz 80386 and 80486 microprocessors, he added.

Warren also said there will be problems with address conflicts, bus noise and line loading with EISA.

"I think Compaq is trying to put itself in a better position where it can negotiate a good licensing agreement with IBM" for a Micro Channel-type machine, Warren said.

Bandwagon effect

If the bus becomes a standard, other companies beyond the consortium will likely embrace it as well.

Brian Fox, a spokesman at Dell Computer Corp., said Dell is interested in the consortium and had some contact with Compaq about it but is not involved. However, it is still possible that Dell will announce its own 32-bit bus at some future point.

Wells American, Inc. in West Columbia, S.C., which was the first vendor to announce a machine that incorporates both the AT-style and the Micro Channel buses, said it could manufacture its computer to accommodate any bus structure and would be interested in the proposed 32-bit bus.

IBM declined to comment directly on the proposed bus standard but said talk of a bus with capabilities similar to the Micro Channel's lends credibility to IBM's bus architecture.

"We have never denied that the Micro Channel capability could not be duplicated or replicated," IBM's Jim Monahan said.

Monahan would not comment on the impact a new bus announcement might have on Micro Channel-based Personal System/2 sales.

Let's see Alan Alda top *this*

The multivendor bus consortium seems determined to make IBM squirm. Not only is the group directly challenging IBM's proprietary Micro Channel bus architecture by extending the capabilities of the AT-style bus, it is even challenging IBM for press coverage.

It had been speculated for several weeks that IBM planned to hold press briefings tomorrow in New York to unveil two Intel Corp. 80286-based, 10-MHz non-Micro Channel-based Personal System/2 Model 30s, which some had dubbed the Model 35 and which are believed to utilize an AT-type bus.

The bus consortium beat IBM to the punch by formally announcing its press briefing for the same day in the same city, forcing IBM to plan its announcement around the consortium's event.

Nonetheless, IBM has officially invited members of the press to meet with its executives to discuss the additions to the PS/2 family.

While some have speculated that stepping back into an AT-type architecture would indicate that IBM is not entirely happy with sales of its Micro Channel products, "We don't believe they're walking away from the Micro Channel," said Clare Fleig, director of research at International Technology Group, a market research firm in Los Altos, Calif.

Both of the Model 30 units will have a 3½-in. floppy drive and 1M byte of memory in the standard configuration, the sources said.

ALAN J. RYAN

Apple, Compaq to launch PCs

BY JULIE PITTA
CW STAFF

Apple Computer, Inc. and Compaq Computer Corp. will share center stage next week as each introduces a personal computer.

Sources briefed by Apple last week said that the company will announce the long-anticipated new version of the Macintosh II Monday. The Mac will be powered by a Motorola, Inc. 68030 processor, a step up from the current 68020-based Mac II.

Meanwhile, Compaq, in what may prove to be a disappointment to its customers, will not introduce a portable version of its Deskpro 386S, a system based on Intel Corp.'s 80386SX chip set. Intel's 386SX will reportedly run software developed for 80386 software on a system built mainly with lower cost components designed for the older 80286.

Compaq officials declined to provide specifics on the company's announcement, scheduled for today.

However, responding to yet another round of published reports that the company is ready to jump into the laptop market as well as mounting speculation that it plans to introduce a battery-powered 386S portable, one official said, "Don't look for a laptop or portable."

Small shoes to fill?

Instead, Compaq will unveil a new look that is expected to become standard for all its PCs, sources said. The new micros will sport a smaller footprint than their predecessors, according to sources. Compaq officials declined to comment.

The introduction of a new Mac contradicts statements made earlier this year by Apple Chairman and Chief Executive Officer John Sculley. At Apple's annual shareholders meeting held in February, Sculley said there would be no new CPU introduction this year. He dubbed 1988 "the year of communications."

Industry observers have speculated that Apple would move up the introduction of the 68030-based Mac to beat competitors like Sun Microsystems, Inc. and Next, Inc. — started by Apple co-founder Steve Jobs — to the punch. Both Sun and Next are expected to introduce their own 68030-based workstations later this year.

X/Open sets standards

BY AMY CORTESE
CW STAFF

SAN FRANCISCO — In a step toward establishing usable hardware and software standards, X/Open is slated to announce today a branding program to identify X/Open-compliant systems.

X/Open is an international consortium of computer vendors working toward developing a common application environment.

"The X/Open brand will give [users] an assurance that certain things will work on a certain level," said Gary Handler, vice-president of market decision systems at Shearson-Lehman Hutton, Inc.

Handler said relieving users of the burden of testing is an important step forward. At Shearson-Lehman, he said, "problems can no longer be solved through a single-source solution, so it is a tremendous relief to see an organization like X/Open get involved."

The program, effective today, lays out the details for testing hardware systems and software applications for conformance to X/Open's Portability Guide. Vendors whose systems pass the conformance tests will be issued a license by X/Open to display the X/Open logo.

X/Open has designated four levels of conformance. Fully compliant systems and software applications should require only basic recompilation in order to be portable across all X/Open-compliant systems.

Tests for hardware compliance will initially be conducted by Unisoft Corp. at the vendor's site or at Unisoft locations in Boston, Emeryville, Calif., London and Tokyo.

Current tests verify conformance to X/Open's Portability Guide 2, published in 1987. The test suite consists of 3,745 tests to verify conformance to operating system services, C language specifications, internationalization and data management. X/Open claimed the tests may take from hours to a week to run.

Testing and verification of software applications, on the other hand, is less rigorous. According to Geoff Morris, president and chief executive officer of X/Open, software developers must go through a checklist of questions regarding conformance before they self-certify their software products. They may then apply to X/Open for a license.

IBM to split up 9370 line

BY ROSEMARY HAMILTON
CW STAFF

IBM will attempt to add some pizzazz to its much-maligned 9370 line Tuesday with the introduction of models that offer 9370 high-end performance at lower end prices, sources said last week.

An IBM spokesman confirmed that the company had scheduled a 9370 rollout for Tuesday, but he did not provide details.

A software developer and consultant, who said they had been briefed by IBM, said the announcement will include three CPUs that would fill in the middle of the 9370 product line. A long-anticipated low-end, or desktop, 9370 and a new top-of-the-line system will apparently not be unveiled this week, they added.

This week's announcement will mark the first CPU additions to the 9370 line since its introduction in October 1986.

To accommodate new models, pricing will be cut on existing systems, the sources said. Interestingly, the 9370s were part of the 5% across-the-board price increase announced by IBM at the end of July.

"It's the standard price/performance kind of announcement, but it'll be greater than the standard 15% improvement," said a West Coast consultant who requested anonymity.

Gene Jablonski, director of computer services at HBO & Co., a software company in Atlanta, said he was told by his IBM representative that the company will introduce models that would fit between the Models 20 and 90. Jablonski's company develops software for the 9370.

"I heard there'd be a Model 30 and others," Jablonski said. "The performance is better [than low-end models], but the pricing is about the same."

But industry analysts contacted last week said that what the 9370 line really needs is high-end systems that would take it well into the 4381 range. Models in the current mid-range to high-end category would have little impact on the market, they added.

"It is their chosen mini 370, but they haven't exploited that role enough yet," said Robert Wilson, vice-president and general manager of the information systems division at Dataquest, Inc. "The line doesn't go up high enough."

One user's current situation supports Wilson's opinion. At Odd Lot Trading, Inc. in Elizabeth, N.J., the data processing staff is reviewing options to replace its 9370 Model 60, according to Stewart Bacheler, director of MIS. Under review is a 9370 Model 90 and a 4381 Model 13.

Bacheler said he is leaning toward a 4381 because a used one would have a lower purchase price than a Model 90. Maintenance for a 4381 would be more expensive, Bacheler noted, but the 4381 would also give him approximately three times the horsepower of his Model 60. The Model 90 would double the current system's horsepower, he said.

"We're not sure the Model 90 would meet our needs," Bacheler said. "If they announce a higher end 9370, that would definitely affect our decision."

RPG software readied for PS/2

BY STANLEY GIBSON
CW STAFF

IBM is set to announce tomorrow software that will make the Personal System/2 a multiuser system and bring the wealth of applications written for the IBM System/36 to the PS/2.

An RPG-II compiler for the PS/2 is expected to be part of a larger IBM announcement tomorrow.

As reported [CW, June 20], IBM will offer a version of California Software Products, Inc.'s (CSPI) Baby/36 product for Microsoft Corp.'s MS OS/2. Mark Toennisson, a spokesman at CSPI, said that both IBM and CSPI will announce packages intended for running OS/2-based systems tomorrow.

"It is the Baby/36 package that was available for MS-DOS personal computers for a number of years," Toennisson said.

"IBM is trying to create a minicomputer with the PS/2," he continued. "This fits in a niche just below the 5363," he added, referring to the entry-level system in the System/36 and Application System/400 lines.

An IBM spokesman confirmed IBM's previously expressed intent to offer a facility for bringing RPG-II applications to the PS/2 and that "IBM intends to announce this fairly soon." He said IBM will be having "a PS/2 announcement with other news" tomorrow.

The IBM product will be called the PS/2 RPG-II Application Platform, and the CSPI version will be called Baby/36 for OS/2, Toennisson said. He added that the IBM version will run only on the PS/2, however, while CSPI's will run on PS/2s as well as IBM Personal Computer compatibles. CSPI performed all development work for both products, Toennisson said.

Toennisson said CSPI will also announce the Automated Conversion System that will allow users greater speed in porting System/36 applications to PS/2s running the IBM RPG platform, or to PC-compatibles running Baby/36. It will be priced at $750.

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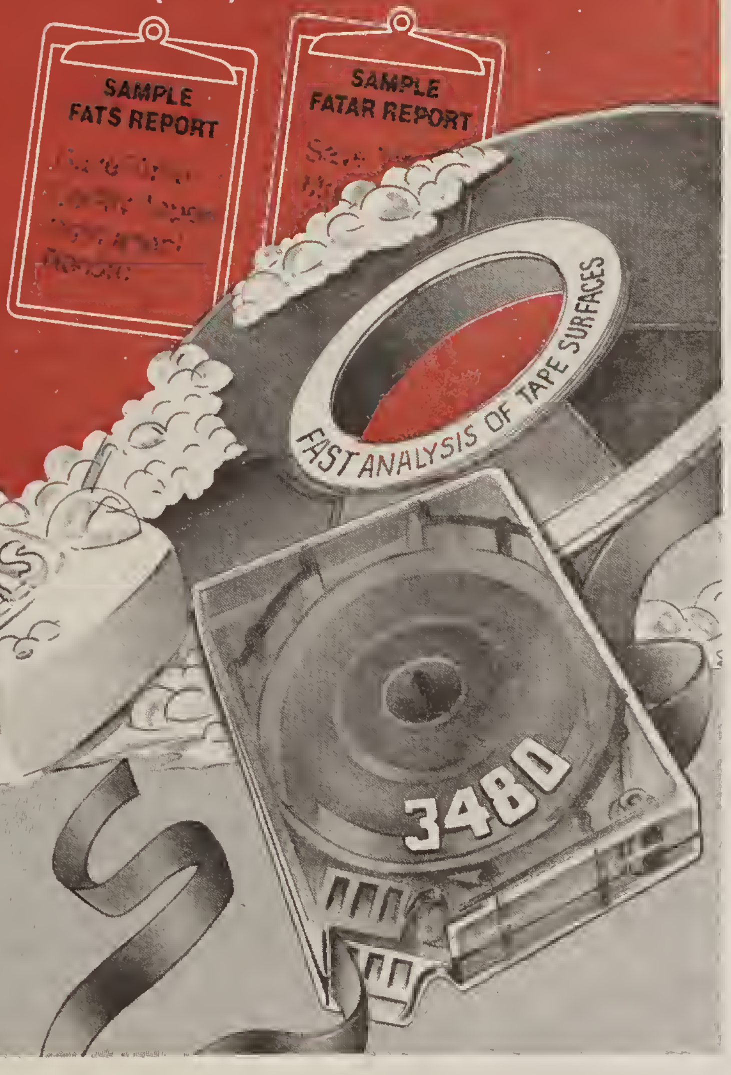

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NEWS SHORTS

Chip learns on the job

Bellcore announced last week its researchers have developed a chip that can learn by example. The chip was structured similarly to the human brain's neural network and contains a circuit that can perform a mathematical logic function called the exclusive OR, or XOR, Bellcore said.

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Virus trial begins in Texas

A trial is underway in Fort Worth, Texas for a former securities firm employee accused of planting a computer virus that wiped out more than 150,000 sales commission records before it was discovered. Donald G. Burleson, 40, a former employee of USPA & IRA Co., reportedly planted the virus after being fired from his job as a computer programmer. A court spokeswoman said testimony began last Wednesday in the jury trial. Burleson is charged with two counts of burglary and harmful access of computer equipment. If found guilty, he could face a 10-year jail sentence and $5,000 fine. USPA & IRA declined to comment on the trial.

……

White in third VM firm

VM expert Romney White has resurfaced again. This time, he is part of a two-man team running Velocity Software, Inc., which is expected to ship its first VM utility by the end of this month. White, who started VM/CMS Unlimited, Inc. in 1984 after leaving Adessa Corp., was forced out last summer by First Alliance Corp., to whom he had sold a controlling interest. Velocity Software is the result of White's teaming with Barton Robinson, an IBM executive until this year, to market a VM/XA monitoring tool developed by Robinson.

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IBM signs up for Smart Card

IBM has acquired a worldwide operating license for the Smart Card and its reader, the French daily *Le Monde* reported Wednesday. IBM can use the license to integrate the card into its personal computers, according to Roland Moreno, the French inventor of the chip card. Sixty-four companies already have an operating license for the 15-year-old Smart Card. Since 1983, 55 million of the microcircuit cards have been manufactured.

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Japan firm to handle IBM service

IBM Japan Ltd. and Kanebo Ltd., a Japanese textile, cosmetics and food firm, announced an agreement Tuesday whereby Kanebo, with its experience in systems management, will assist the overseas offices of Japanese financial firms in setting up and using their IBM computers. The firm previously set up its own companywide information system.

……

Fujitsu melds U.S. divisions

Fujitsu America, Inc. consolidated three U.S. operations into a new voice and data communications unit called Fujitsu Business Communication Systems, Inc. in Anaheim, Calif. Fujitsu also bought out GTE Corp.'s 20% stake in Fujitsu Business GTE Business Systems. The unit, effective Oct. 1, will combine that joint venture, Fujitsu Business Communications and Fujitsu America's Customer Premise Equipment Development division.

……

No fire sale on Token-Ring

IBM's recent fondness for quietly raising prices has extended to its 4M-bit Token-Ring adapters. An IBM spokesman recently confirmed 5% price hikes on three boards:

- PC Adapter I, a 4M-bit card that fits Personal Computers and the Personal System/2 Models 25 and 30. The old price was $695; it is now $728.
- PC Adapter II, which fits the same machines as the PC Adapter I but boasts more memory and targets file servers. It was $895; it now costs $939.
- PS/2 Adapter III, a Micro Channel Architecture board that fits the PS/2 Model 50 and higher. It cost $795; the new one is $833.

Round 1 in Lotus copyright trial

$100 million suit seen as critical test of infringement protection

BY JAMES DALY
CW STAFF

BOSTON — The opening shots in what may develop into a far-reaching war over the scope of software copyright protection were fired in federal court last week as Software Arts Products Corp. called its first witness in a $100 million lawsuit against Lotus Development Corp.

At issue in the trial, which some view as a crucial test of software copyright protection, is whether Lotus and its founder, Mitchell D. Kapor, misappropriated trade secrets and infringed on the copyright of Software Arts' now-defunct Visicalc when Lotus designed its best-selling 1-2-3 electronic spreadsheet.

Under an agreement reached by both parties, U.S. District Judge Robert E. Keeton will first determine whether Software Arts has the right to continue its suit against the software giant or whether its claims were forfeited when it sold its assets to Lotus for $2.4 million in June 1985.

Software Arts' charges against Lotus include copyright infringement, breach of contract, unjust enrichment and misappropriation of confidential information and trade secrets.

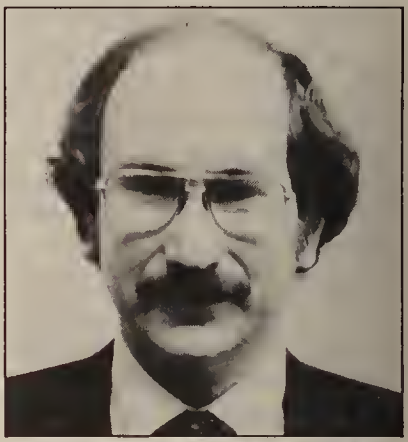
The Software Arts lawsuit charges that Kapor violated a 1981 nondisclosure agreement. At the time, Kapor was working for Personal Software, Inc., an exclusive marketing agent for Visicalc.

Under the beta-test agreement signed by Kapor as a contractor in 1981, Kapor was to "preserve and protect the confidential information and the materials as confidential to Software Arts, Inc." The agreement specified that Kapor "not disclose or disseminate . . . to any other person or entity, except as authorized by Software Arts."

Visicalc had ruled the spreadsheet roost until 1-2-3's introduction in April 1983. Soon after its unveiling, 1-2-3 went on to become the best-selling program in the industry's history and quickly cut into the stunned Visicalc's market.

Early testimony by ex-Software Arts Chief Operating Officer Julian E. Lange did little to clarify the murky waters in the case. Lange, who along with ex-Software Arts executive Tracy Licklider filed the suit against Lotus in April 1987, spent several hours on the stand in front of Lotus attorneys defending his view that the infringement occured prior to Lotus' acquisition of Software Arts.

Lange added that his earlier statements to stockholders, customers and creditors of Software Arts revealing that the company had sold "substantially all" of its assets to Lotus "were not correct."


Software Arts' Lange

It was also disclosed that what was then Bolt Beranek & Newman, Inc. — now BBN Advanced Computers, Inc. — and Ashton-Tate Corp. had expressed an interest in acquiring Software Arts when the struggling company was looking for a buyer.

DEC soiree

FROM PAGE 1

vide a blueprint for managing voice, computer systems, databases and applications, Korf said.

It will be based on the ISO's Open Systems Interconnect (OSI) standard but will go beyond it in terms of functionality, Korf added. While refusing to commit to a specific product-release time frame, Korf mentioned a "phased release" of products, adding, "it is not beyond the realm of possibility that the first pieces will appear within 12 months."

DEC is copying IBM's bad habit of preannouncing products that are still at least a year from commercial availability, according to Peter Schay, program director of office information systems at the Gartner Group, Inc. DEC needed to provide a "comprehensive vision [in order to] seriously enter the marketing wars against IBM's Netview," which also provides more vision than substance right now, Schay said.

EMA will provide the following, DEC said:

- A director-entity relationship, similar to the OSI model, that allows some equipment as management nodes and others as "things to be managed," Korf said. The two types of entities will communicate using OSI protocols, including Common Management Information Protocols. This allows customers to either distribute management functions across many nodes or centralize them on a single host, Korf said.
- A Presentation Module or user interface that can be tailored to the manager's expertise level, providing raw data for seasoned users or a window- or menu-based interface for less seasoned managers.
- A "software backplane" that will include application interfaces that DEC will make available to users and other vendors that want to hook applications, computers and networking equipment into EMA.
- A Management Information Repository, or common database, that can contain network traffic and error statistics as well as other management data and that "should be accessible by any fourth-generation language," according to Korf.
- The ability to manage applications and operating environments — initially just DEC offerings such as Ultrix, VMS and All-In-1. Functions will reportedly include the abilities to set user privileges, control access of data and function and regulate allocation of disk space.
- The ability to respond intelligently and automatically to network events such as downed lines and to keep track of moves and changes. These functions are already resident in Decnet but will be extended to non-DEC systems that support EMA software interfaces, Korf said.

Pitney Bowes has been waiting for a system to manage its multivendor installation, which includes equipment from Sun Microsystems, Inc., Apollo Computer, Inc. and AT&T as well as DEC. "A common database and multivendor network management would certainly make life easier for us, filling holes where we are lacking information right now," said George Billings, a manager of network computing services at one Pitney Bowes division. "We can get all kinds of statistics from our VMS installation, but DEC provides no comparable tools even for Ultrix, and we have no way to pull together other vendors' management stuff except manually."

Unfortunately, DEC's new architecture is likely to provide only part of the solution, Schay said. EMA should be a "sound offering for managing a network of DEC systems, plus third-party data communications components," but "DEC has provided no way to manage a mixed Decnet-SNA environment, just as IBM has kept DEC out of its Netview solution," Schay said.

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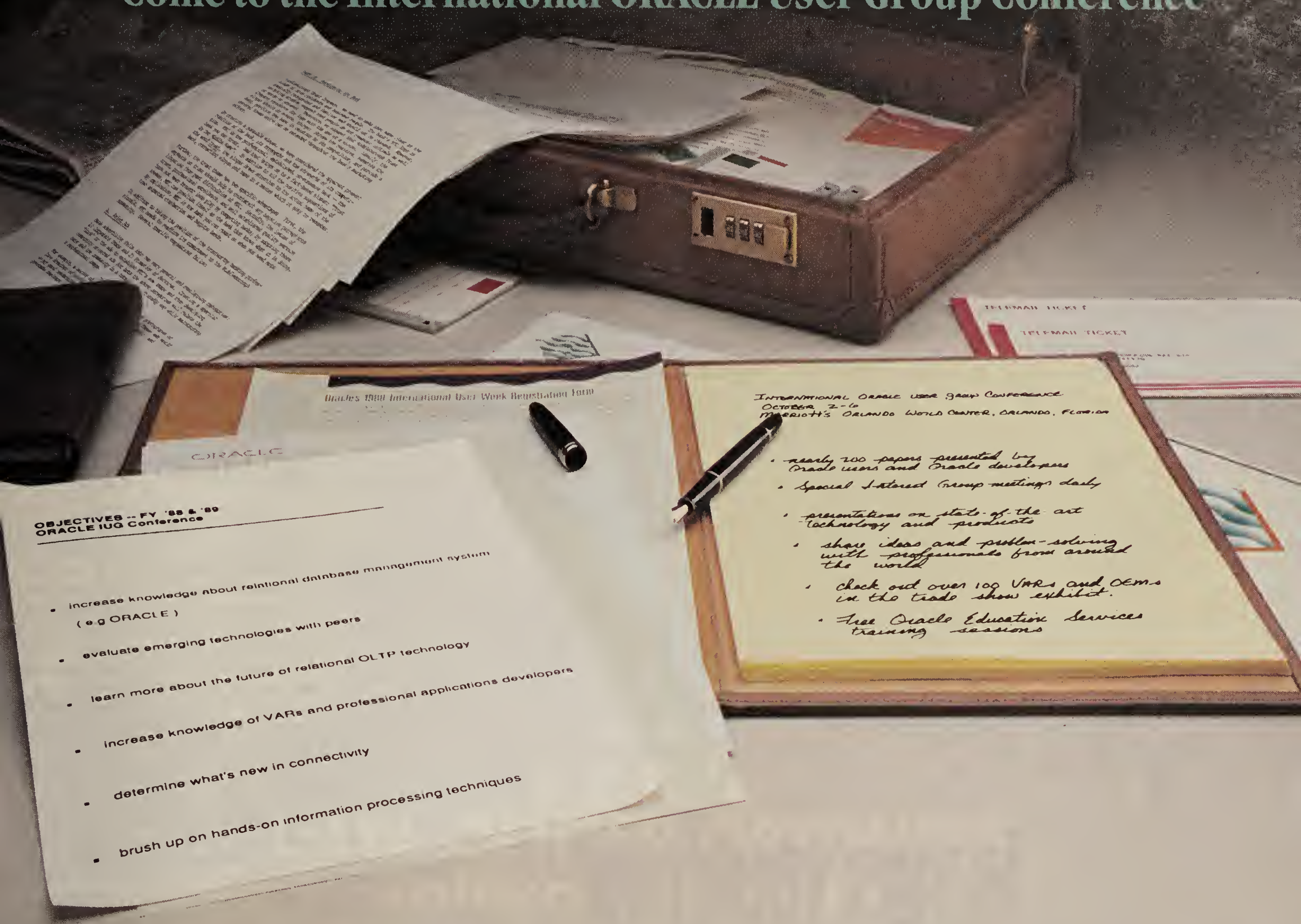

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COMPUTERWORLD

Apple, DEC to back groupware product

BY DOUGLAS BARNEY
CW STAFF

SANTA CLARA, Calif. — So far, groupware has been little more than a vague concept. But this new approach to computing should be a bit less foggy after Friday, when both Digital Equipment Corp. and Apple Computer, Inc. give their blessing to a networked document management system from Odesta Corp.

This is expected to be the first joint Apple-DEC show of support for any third-party product and will be announced at the Seybold Desktop Publishing Forum in Santa Clara, Calif.

The Odesta Document Management System (DMS), according to information obtained by *Computerworld,* is a suite of products based on Odesta's Helix database management system and aimed at improving work flow on either DEC VAX or Apple Macintosh computers.

Collaborative computing

By storing documents on either a VAX or Macintosh, which act as hosts, the DMS will help do so-called collaborative computing. Not only can multiple users access a common document, but the system can track changes to the document, time of changes and who made them. Managers can track several elements, including deadlines, dates and actual text and send back work with annotations and new deadlines. The system also contains searching techniques derived partly from personal information managers.

"From a Macintosh standpoint, you can bring in any Macintosh document or applications into a Helix collection. The system treats the item as another form of information. You can do queries to find out when it was created or modified and who did it," said one beta tester currently running the system under Apple's Appleshare, Sun Microsystems, Inc.'s Tops and Ethernet.

Unlike other groupware-oriented products such as Lotus Development Corp.'s Notes, which is expected to ship next year, DMS will ship by year's end, a source close to Odesta said.

The system will eventually support DEC's Compound Document Architecture (CDA), a software specification that provides live links between a document and the data it is based on. DEC is expected to announce tool kits for vendors or users interested in developing CDA-compatible applications.

Several beta testers are expected to attend the Seybold Desktop Publishing Forum announcement.

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Migration aids on tap for 3+Open

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. last week revealed its strategy to migrate current users of its 3+ network operating system to 3+Open next-generation software based on Microsoft Corp.'s OS/2 LAN Manager. The migration products will reportedly be out in December.

The 3+Open product line is slated to begin shipping next month and will provide support for Microsoft MS-DOS, IBM and Microsoft OS/2 and Apple Computer, Inc. Macintosh workstations, 3Com said. Initial versions include both the 3+Open LAN Manager Advanced System (AS) for unlimited users at $2,995 and the Entry System, which supports as many as five users for $995.

The migration program will target 3+Open AS users and was designed for network servers, whether they are adapted personal computers or 3Com's line of proprietary servers such as the 3S/400, 3S/200 and 3Server3. The 3+Open Entry System is targeted at first-time or very small network users.

There is no file or software conversion involved because OS/2 supports MS-DOS and 3Com uses a standard DOS disk format on its server, explained Alan Kessler, 3+Open's product manager. He expects the bulk of 3+Open users to attach DOS workstations to OS/2 servers.

Adapted PC servers running 3+ can be converted to 3+Open for $1,695; new users will pay $2,995. The comparable version of 3+ costs $2,100. This migration package reportedly provides the 3+Open LAN Manager AS for PC server, which includes OS/2 software for the server and network software for the DOS and OS/2 workstations.

The Intel Corp. 80386-based network servers can be converted to 3+Open for $1,995. The software migration package consists of 3+Open AS for the 3S/400 server and includes the same server and client software detailed above.

Also provided are services for tape backup and server booting of DOS workstations such as 3Com's diskless unit. A copy of DOS with a five-user license is also included.

A turnkey package priced at $7,995 will be offered to users converting their Intel 80186-based 3S/200 or 3Server3 servers to a 386 chip and 3+Open.

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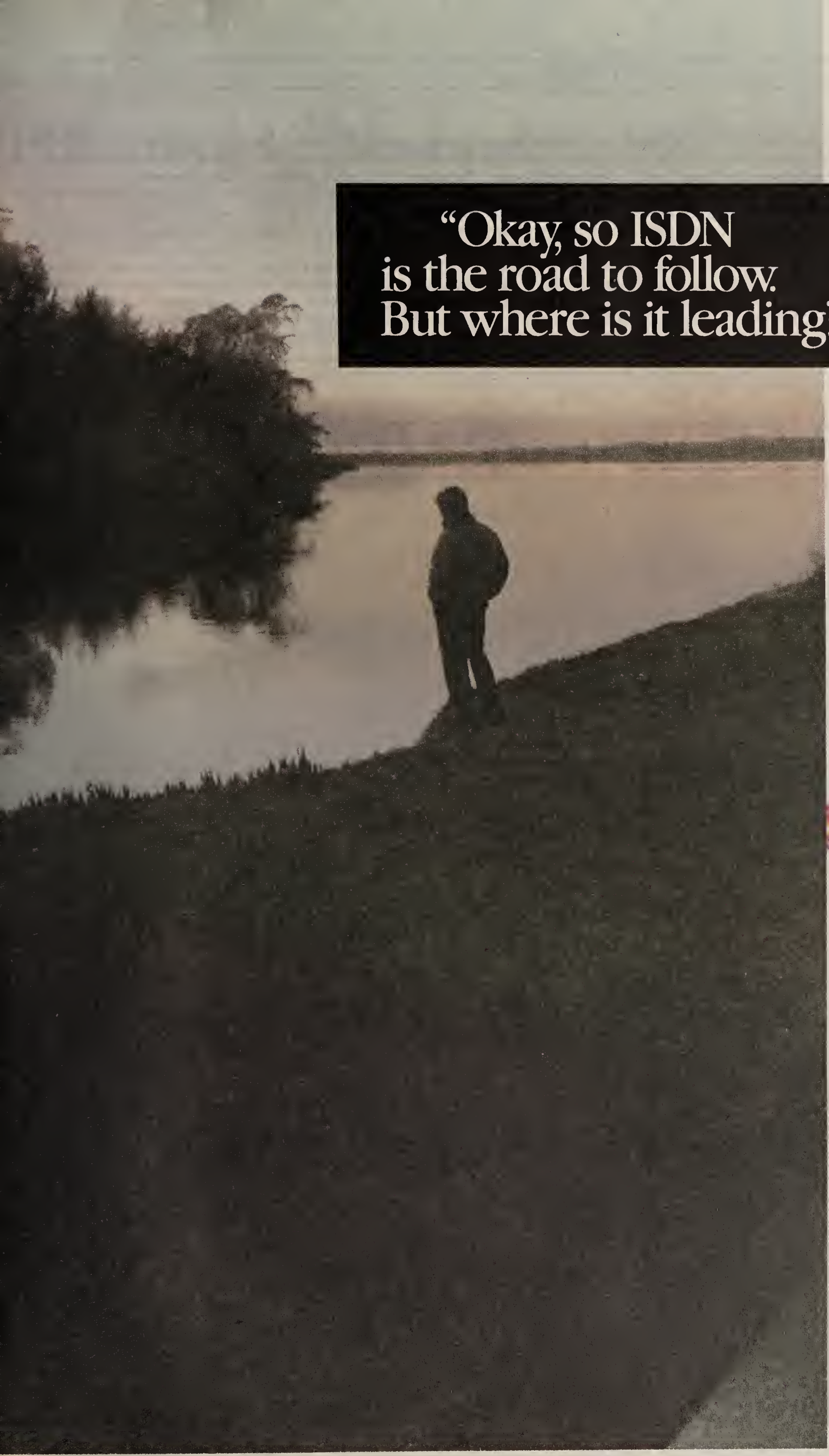
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Extended

FROM PAGE 1

If successful, COIN will also result in a dramatic repositioning of the bank's IBM mainframes currently running IMS and will usher in a new era of cooperative processing. Instead of the mainframe supporting both information processing and providing the screens that end users see, the tasks will be broken up. "We are removing most of the presentation management out of the host and slowly migrating the host to a transaction-based system," Skeados explained.

The goal is to have the host utterly unaware of what type of system is requesting the information, be it a PC or automated teller machine. That means removing the host's "hardware sensitivity," allowing the bank to add new information delivery systems without impacting the mainframe application.

Bank of America's Skeados

In the case of the PC, it will use the OS/2 Extended Communications Manager to transparently front-end IMS on the host. Bank of America programmers are working hard on the interface so that users making a transition to OS/2 will not know whether they are working on an MS-DOS or OS/2 system.

Although the plans have not congealed, Bank of America expects to work in several phases. First, the firm will develop a network server using IBM's OS/2 LAN Server that will support tellers and back-office PCs. The servers should be ready for production use in the second half of next year. Much of the server's work will be to distribute software to workstations and provide network management by interfacing with IBM's Netview.

Also on tap for 1990 is the creation of roughly 10,000 teller workstations and 6,000 back-office machines. For competitive reasons, Skeados declined to say what the teller workstations would do that cannot be done with today's systems.

For Security Pacific, OS/2 Extended will be handy for several tasks, from interfacing PCs with local-area networks to a complex imaging system.

A key use will be within the Computer Performance Services Group, which monitors mainframes at the bank's various data centers. "We do a lot of downloading of files, and the current system is very slow," explained Dave Hefler, vice-president at the bank. "With OS/2 Extended Edition, you can move more data a lot faster."

Complicating the downloading problem is the wide variety of DBMSs that the group must contend with. Fortunately, one DBMS has risen above the rest. "We are heavily into DB2. Our database administrators were using Extended Edition to access DB2 and download data. It looks like a good product to use in distributed processing or distributed files," Hefler said.

One group under the Security Pacific umbrella expresses less certainty about the use of OS/2 Extended. For the data processing arm of Ranier National Bank, which is owned by Security Pacific, the word on OS/2 Extended is a definite maybe.

"In the late 1989 time frame, we might be able to get into it. But we see it on servers, not on individual PCs," said Terry Lelievere, senior systems programmer at SPAC/NW, the group responsible for Ranier's data processing.

Although an Amoco source said the company is very impressed and committed to OS/2 Extended, some IBM bureaucratic bungling kept Amoco officials from commenting. The firm is, however, a user of DB2 and has been seeking better ways of sharing host data with PCs.

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IBM turns to Apollo network for AIX

Agreement hoped to be a long-term front against Sun-AT&T alliance

BY ELISABETH HORWITT
CW STAFF

Solidifying what may become a long-term united front against their mutual competitors, IBM has licensed Apollo Computer, Inc.'s Network Computing System (NCS) and intends to implement it on its AIX systems, the two vendors announced last week.

IBM plans to add NCS to its Distributed Services offering, a software program that runs on top of AIX and "provides an easy flow of data between computers," IBM spokesman Rusty Carpenter said. A major reason for IBM's decision to license the product, according to Carpenter, was its desire to "be a better member" of the Network Computing Forum, which IBM joined last May. The forum is a vendor consortium that has been developing an NCS-based distributed processing system.

The alliance is meant to boost NCS and AIX as de facto industry standards in the face of heavy competition from Sun Microsystems, Inc. and AT&T, according to Clare Fleig, director of systems research at International Technology Group (ITG) in Los Altos, Calif.

Apollo, which posted a loss of close to $8 million last quarter, "has suffered from the fact that NCS is not as popular as Sun's Network File System," Fleig said. IBM's licensing of NCS could encourage more computer vendors to support Apollo's software, she added.

Marriage of convenience

The agreement could lead to an IBM equity investment in Apollo, ITG Director Brian Jeffery speculated. "It would be a marriage of convenience: IBM has the standards clout, while Apollo has the installed base in the workstation market," a niche that IBM has long coveted, he said.

"The weight of IBM certainly counteracts other vendor combinations," Apollo spokesman Saul Marcus said.

The combination that most concerns Apollo and IBM is the Sun-AT&T alliance to create an interoperability standard based on AT&T's Unix System V, Fleig said.

Both IBM and Apollo are members of the Open Software Foundation (OSF), which has already adopted the AIX kernel as the basis for a proposed alternative to Unix System V as a multivendor operating environment. Apollo recently proposed that NCS also be incorporated into the OSF's proposed standard.

While refusing to comment on the IBM-Apollo relationship, a Sun spokesperson said, "Our IBM connectivity story is going to be strengthening a lot over the next nine months. Some developments are imminent." Sun is rumored to be on the verge of announcing an IBM mainframe implementation of NFS.

Apollo has begun work to port NCS to IBM mainframes as well as other operating system environments, Marcus said.

Carpenter would give no time frame for when the NCS-based products would be available and declined to specify exactly what role NCS would play in an AIX network.

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Easing IBM-DEC transfers

BY ELISABETH HORWITT
CW STAFF

IRVING, Texas — Software made commercially available last week by The Systems Center, Inc. overcomes most of the bottlenecks that slow data transfer between IBM and Digital Equipment Corp. hosts, according to beta user Mcorp, Inc.

Network Datamover-VMS, known as NDM-VMS, works with Systems Center's existing IBM-based Network Datamover software to perform IBM-to-DEC file transfer at consistent rates of 62K bit/sec. over a 56K bit/sec. line, according to Richard Garlock, Mcorp's vice-president and manager of financial systems.

The Dallas-based financial service company had been looking for a more efficient way to transfer files between IBM mainframes that collect financial data from 26 branch offices and DEC VAXs that generate and print reports for various user accounts, Garlock said.

Mcorp had found that IBM RJE software combined with DEC's Decnet/SNA Gateway could not go any faster than 19.2K bit/sec., he said. NDM-VMS, which the company finished installing last July, supported higher speeds — partly because of a data compression capability and partly because it can send data directly to various user accounts without preliminary staging or spooling, Garlock said.

Because RJE can address no more than three accounts, financial data had to be sent first to a central repository, where an internally developed program would sort the information and direct it to the right account, he added.

Garlock said he also likes NDM-VMS because it uses VAX-like commands and allows file transfers to be initiated with simple instructions, such as Copy. Mcorp's earlier configuration required users to create cumbersome routines using IBM's JCL.

NDM-VMS supports RMS files and VMS library files. It is said to provide online management control features, including statistics and audit trails. It supports security features in both DEC and IBM host environments, the vendor said. Available now, the product costs between $5,400 and $24,000.

Systems Center has no immediate plans for supporting IBM's LU6.2 protocol, company spokesman Darwin Busa said. While the IBM Systems Network Architecture-based peer-to-peer networking protocol would provide a consistent software interface across non-IBM systems that support it, LU6.2 is less efficient than the LU0 protocol when it comes to data transfer, Busa added. IBM's own bulk data-transfer product, File Transfer Protocol, also uses LU0.

Systems Center plans to start beta testing a Tandem Computers, Inc. version of NDM shortly, Busa said.

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The virtual disk can be used for almost anything that does not require permanent retention beyond system start-up (IPL). Examples are compiler work files, SORT work files, temporary files used within or between application jobs. Application programs are not affected, the JCL is simply changed to point to the virtual disk drive 'address'.

A built-in aspect of the product is that the DOS/VSE Label Area is relocated to the virtual disk. This area is one of the most frequently accessed in most DOS sites, so moving it to the virtual disk should result in significant performance improvement to the overall system, regardless of any other specific use of the virtual disk capability.

BIM-VIO is priced at $3600 for a permanent license, $1800 on an annual lease or $180 on a monthly rental.

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Integrator buys Index Group

BY JAMES CONNOLLY
CW STAFF

Computer Sciences Corp. (CSC) moved last week to extend its drive from its base as a federal systems integrator into the commercial sector by acquiring the management consulting firm Index Group, Inc. in Cambridge, Mass.

The acquisition, for an unspecified price, was initiated by CSC several months ago, according to Thomas P. Gerrity, Index's chairman and chief executive officer. It was announced 18 months after Big Eight accounting firm Peat, Marwick, Main & Co. made its move into executive-level MIS consulting by buying Index rival Nolan, Norton & Co.

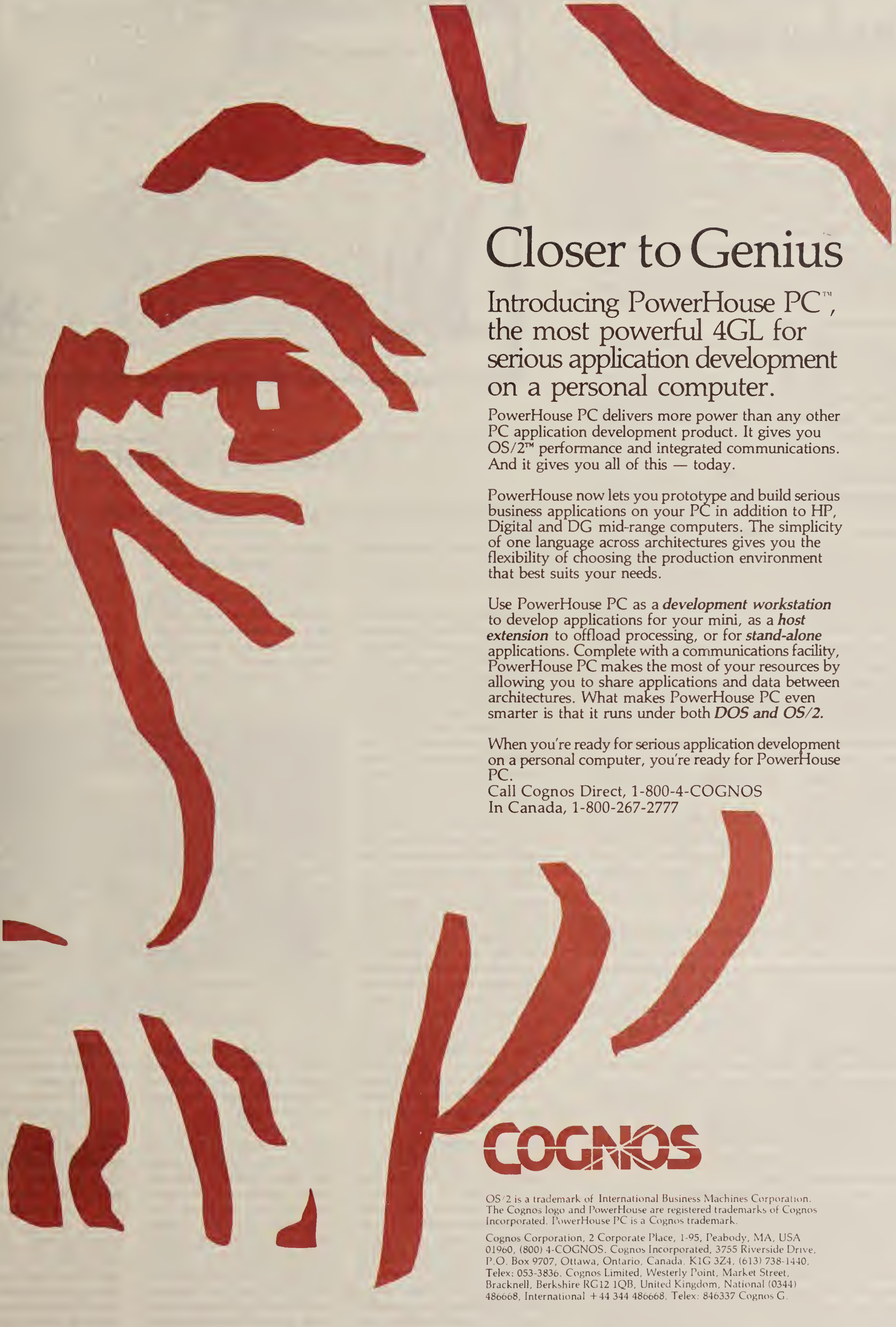
Index, founded in 1967, has focused its attention on the use of information and information technology to produce business results and has handled only a limited amount of systems implementation work since spinning off a development group in 1982. Index lists some of the largest corporations among its clientele, including Citibank NA, General Electric Co., Ford Motor Co. and IBM. Under the agreement, Index will operate as an independent subsidiary under its current management, although several CSC executives will join the Index board of directors.

'Adds leadership'

CSC Chairman William R. Hoover, in announcing the deal, said, "The acquisition adds senior consulting leadership in the strategic use of information resources to our extensive capabilities in system design and implementation."

The acquisition is one additional step in the ongoing effort by El Segundo, Calif.-based CSC and other systems integrators to expand into the commercial sector. A spokesman for the $1.15 billion CSC said the company has been gaining 30% of its revenue from non-federal government sources in recent years but that CSC wants to continue diversification with the goal of gaining 40% of its revenue and 50% of its profits from nonfederal sources by 1991.

Gerrity said that Index clients can benefit from that group's ability to broaden and deepen its offerings by drawing on CSC's resources, particularly its experience in implementing leading-edge technologies for government space program and defense department clients.



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EDITORIAL

The hot hundred

HOW DO YOU assess the value of your company's investment in information systems?

If your firm is like the vast majority of companies in the U.S., that investment is very large and growing faster than any other discrete investment the company is making.

More important, that investment is increasingly being tied to — and even bearing the responsibility for — the company's overall success, or at least its ability to respond adroitly to new market opportunities.

Accompanying today's issue is an 84-page magazine, the *Computerworld Premier 100.* Simply stated, the Premier 100 represents the most comprehensive attempt at quantifying and qualifying the prodigious investments in information systems made by America's leading firms.

Unlike other lists that merely rank these investments on the basis of their size — which we found reveals very little about the *quality* of the investment — the Premier 100 ranks companies according to how well they stacked up when measured by six criteria. The size of the total information systems investment was just one such criterion. In addition to the size of the installed base, the criteria were MIS budget, the firms' sustained rates of profitability, investment in information systems staff, training outlays and user system access as measured by the number of terminals and personal computers in use.

How did we get all this information? Very painstakingly and with a significant amount of resources. But that's the only way to get the data necessary to attempt quantifying the value of information systems.

Equally as important, the Premier 100 breaks down the surveyed companies into vertical categories so that a company's commitment to computer equipment, training and PCs can be measured against that of the leaders in those particular vertical markets.

The findings are both elucidating and surprising. Two companies with investments in information systems in excess of a half-billion dollars — Exxon and Mobil — never made it into the Premier 100. In fact, only two petroleum firms made it into the top 50, reflecting continued economic struggles in the oil patch.

Utilities, on the other hand, placed four companies in the top 10, including the No. 1 company. While utilities don't necessarily spend the most on information systems per dollar of revenue, they do invest heavily in training and end-user computing, two important criteria of overall systems effectiveness.

We found that the leading firms have much in common, both from a pure business perspective and a philosophical one. For one thing, their strategies are aimed at developing systems to directly aid in capturing market share and profit.

But another common thread is recognition of information systems' relevance at the very top levels of the company. The age of justifying systems investments on pure faith is rapidly fading.

LETTERS TO THE EDITOR

South Africans have their say (and then some) on sanctions

As a U.S. citizen living in South Africa, I take strong exception to your recent editorial [CW, June 20].

Not only is the situation generally far different than you suppose, but the attitude in the computer industry in particular is strongly egalitarian and progressive, and the industry is helping to lead the country in the direction of meaningful reform.

If the sanctions policy you advocate is implemented, it will do a serious disservice to South Africans of all races and will set back the progress of reform by some years; you must then bear part of the blame for your well-intentioned but misguided promotion of that policy.

Whether the misinformation reported is innocent and well-intentioned ignorance or deliberate and malicious prejudice, suffice it to say that not all that appears in the media is accurate, and it is not safe to base international economic policy on what is reported there.

Gerald R. Reynolds
Chairman, Science Department
Manager, Computer Services
Helderberg College
Somerset, South Africa

I am not clear what provides you with the high ground to use your respected publication [CW, June 20] to advise U.S. companies to end their business relationships with South Africa. Just as in the days when the spread of Christianity was spearheaded by missionaries, so today many U.S. companies have led the way in the evolutionary processes that start in the business environment and flow through to all areas of life in South Africa. The directive should be not to withdraw the missionaries but to send more.

Economic sanctions and disinvestment will inevitably lead to much hardship and unemployment, particularly among those people you seek to assist. Should these same people have wished this upon themselves, they could have resorted to a mass withdrawal of labor at any time, yet this has not occurred. What gives you the right to prescribe what is best for the South African breadwinner when such decisions can be made quite adequately by the breadwinner himself?

Your analysis is gravely flawed and your advice is wrong. I must construe that your motives for publishing this article were well-intentioned; however, I suspect that some cheap moral upliftment was the prime driver.

R. C. Maydon
Financial Director
Edgars
Crown Mines, South Africa

Assume that your call for "multilateral economic sanctions against a repressive regime" [CW, June 20] works. What is the expected result?

Related to your field of knowledge, that means no more supplies of computer equipment (spares included), software, education, training and the expertise needed in their effective use.

Just like your country, South Africa makes use of computers in *all* walks of life, including schools, universities, hospitals, clinics, social welfare programs and the building industry, as well as in commercial business — mining, manufacturing, finance, etc.

Assume that, instead of sanctions, you were to call for increased investment in education, health care, social responsibility programs, and so on, and direct it toward the black, yellow and brown people of this country.

By the time that a black-dominated government does take power, it will be taking a "going concern" that is relatively healthy, that can compete in world markets on its own merits.

M. G. Ferrari
Johannesburg, South Africa

I am not sure whether we in South Africa should find your "moral" stance [CW, June 20] farcical or disgraceful. It has become abundantly clear in recent years that if one needs to know the truth, the last place to look for it is in the so-called free mass media.

Rather than abandoning all of South Africa's people and dishing out the type of punishment that sanctions represents, why not help those vast numbers of us here who care about our country and the development of a just and meaningful future for all South Africans?

If you really want to help the black people of South Africa and take a moral stance, then urge your American corporations to remain in South Africa and get them to donate all of their profits here to the cause of black ed-

Continued on page 21

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

OSI a high-stakes game to play

DALE KUTNICK

During the past 18 to 24 months, the Open Systems Interconnect's (OSI) seven-layer reference model has been gaining momentum.

It will soon be demanded in the requests for proposals of large users, particularly U.S. and European governments, the military, defense contractors and some manufacturers (like General Motors).

Recent market surveys say that more than 50% of Fortune 1,000 companies believe that they will be using at least some OSI-based networks and protocols by the early 1990s.

To promulgate this trend, standards organizations are finally accelerating the specification process, and they are developing product testing and validation procedures and centers, along with organizations like the Corporation for Open Systems. In the past year, three Layer-7 standards have been specified: FTAM, MHS and X.400.

In addition, vendors are forging ahead, announcing not only their future support for OSI but also beginning to deliver products. IBM, for instance, has opened OSI conformance-testing centers in Europe and is now delivering OSI transport and session protocols — Layers 4 and 5 — there. DEC and Hewlett-Packard are not far behind.

BOB DAHM

Other vendors that are unable to wait for OSI network management standards, which are not expected for at least two years, have formed the OSI/Network Management Forum. Led by HP, AT&T, Unisys, Northern Telecom, British Telecom, Amdahl, STC and Telecom Canada, the group's intent, in part, is to offer an alternative to IBM's Netview.

Too many chefs?

Notwithstanding all of this activity, the standards issue remains a thorny one because the market is evolving. Users' network requirements are becoming more sophisticated and mission-critical to their business operations.

New applications and new modes — like cooperative processing and distributed DBMS — are being developed to exercise a network technology that is still in its infancy.

Moreover, there are already too many specifications, like the IEEE local-area network standards, within some layers. Attributes in other layers, like addressing and routing — Layer 3 — are not sufficient for future networks.

Agreements are still difficult to forge when vendors keep sending new people to standards meetings, when all participants are not up to speed and when voting is self-serving or politically motivated.

These problems will likely be exacerbated over time — partly because of the double-edged sword of proliferating standards bodies and to flag-waving, independent groups pushing their own standards.

The bottom line is that the promise of interoperability will not come easy without higher level gateways and protocol converters.

Still, the standards provide an excellent common denominator that should enable vendors to invest in new areas that offer higher value added.

But therein lies the major problem. Most vendors will have difficulty affording the research and development necessary to join the "forced march" to the OSI promised land, let alone to push beyond its limits. These system vendors face even more difficult standards issues as they race — at least in their public posture — toward OSI support:

- Implementation of the OSI stack onto their proprietary hardware and operating environments will generally be an expensive and costly R&D exercise.
- They must continue to support their old network architectures while awaiting final standards and then bridge their installed base to their OSI implementation — again a costly imperative.
- They must also support interfaces to IBM's latest extensions to Systems Network Architecture (SNA), including LU6.2, Advanced Peer-to-Peer Networking, PU2.1, SNADS and so on, because it is a de facto standard with nearly 40,000 networks installed worldwide.

Moreover, a given vendor may be forced to support SNA interfaces to both its proprietary network architecture and OSI implementation. (This is one of the reasons IBM's LU6.2 was proposed by a few European vendors as the OSI transaction interface — because they must support it anyway.) Again, these interfaces will be extremely expensive.

- Vendors must provide some levels of differentiation — functionality, efficiency, connectability, serviceability, security and so on — among the pack providing OSI network solutions, which is not a trivial exercise.
- Finally, vendors must contend with the Unix threat. Not only does it add another operating system and interface that they must support, but it will also compete with their proprietary solutions — offering more third-party software support, less expensive hardware platforms and less residual software baggage. Indeed, OSI and Unix will be beneficial to each other and thus to new architectures (software and hardware) that exploit them.

In conclusion, all major system vendors — with the exception of IBM — must support interconnections, utilities and program interfaces to at least three network architectures — SNA, OSI and their own — while offering high functionality and efficiency.

They must also respond to the Unix phenomenon — both competitively and developmentally. From an R&D cost standpoint, the networking situation is becoming, or already is, untenable.

Vendors must, therefore, carefully select their OSI and SNA interface and find competitive advantages.

Users should be wary of OSI compatibility claims: The more a vendor talks about OSI futures when asked about current network offerings, the less it can deliver today.

Kutnick is a data processing and communications consultant based in Redding, Conn. He was formerly executive vice-president of research at the Gartner Group, Inc. and executive director of Yankee Group.

OS/2 to hopscotch DOS, but cost trips acceptance

AMY WOHL

We are nearing "truth time" for OS/2. The operating system and OS/2 Extended Edition are already available. Soon we will have OS/2 versions of at least some DOS software packages, followed by OS/2 Release 1.1, with its Presentation Manager interface.

A recent industry survey stated that 14% of the Fortune 500 companies are now using some OS/2, and 50% expect to be using some OS/2 by May 1989. We suspect that "some" might be a very small number, now and next spring, given that OS/2 requires 1.5M bytes of memory. Very few installed personal computers or compatibles have more than 1M byte of memory.

The Presentation Manager, of course, requires much more memory. (IBM has estimated 3M bytes, Microsoft's Bill Gates has estimated 4M bytes, and, we suspect, useful environments might need even more.)

Old Personal Computers and PC XTs don't count in the OS/2 game yet. They are placeholders, in some cases, representing potential sites for more powerful machines.

Many users of PC ATs — and many of the millions who bought Intel 80286-based machines after IBM's April 1987 announcement of the Personal System/2 product line — think they are secure with good DOS environments today and the ability to run OS/2 tomorrow.

But I have never been convinced that an AT could easily be upgraded to an OS/2 platform. So I asked a number of PC resellers about what the cost would be to a customer in upgrading a standard 640K-byte AT to an OS/2 with a Presentation Manager-capable system. Most resellers estimated boards, memory chips and installation would run between $1,500 and $2,000.

It is clear that no one else is asking this question. AT users just aren't looking at upgrading for OS/2 yet.

No wonder. If your company has a few thousand dollars to spend on PCs — or a few million — it's unlikely to upgrade an AT when OS/2 does not yet run most of the popular applications in native mode. Companies are more likely to spend the money to equip new users with clone-type ATs, especially since more than half the desk tops remain to be equipped.

Of course, OS/2 runs DOS programs in the emulation box, but I can have single-tasking without OS/2. Many PS/2 buyers aren't in this OS/2 game either.

Approximately half of the PS/2 installed base consists of Model 25s and 30s, and they can't run OS/2 at all. Users of 50s and up can, of course, choose OS/2 as their operating environment, but very few PS/2s are being delivered with 1.5M or 4M bytes of memory, so these folks are also in the upgrade boat.

> OLD PCs and PC XTs don't count in the OS/2 game yet. They are placeholders, in some cases, representing potential sites for more powerful machines.

We estimate a PS/2 Model 50 upgrade ranging from 1M to 4M bytes at about $2,050.

Naturally, if you need to upgrade many machines, it would be better to wait for chip prices to come down. This price break is likely to occur by early next year. Such a delay is unlikely to represent a major problem for most upgraders.

A substantial portion of the cost of an OS/2 upgrade is the operating system. You probably had DOS bundled with your original system. OS/2 costs $395, and OS/2 Extended Edition costs $795. OS/2 Extended Edition is the one you will probably want to buy if you plan to use your PC or PS/2 as a front end to such IBM products as MVS, VM with the Professional Office System or the new Application System/400. People all assume that the best workstation interfaces run on PCs and that all target OS/2 with the Presentation Manager as the Systems Application Architecture platform for the graphical user interface.

The cost is per machines, folks, although we assume that IBM customers with volume purchase agreements will get suitable discounts and normal channel discounting.

Please note that unlike DOS, OS/2 is customized to some machines. This issue is particularly complex for the normal "big shop" that has been buying PCs since 1981 and now has a compli-

Continued on page 21

Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

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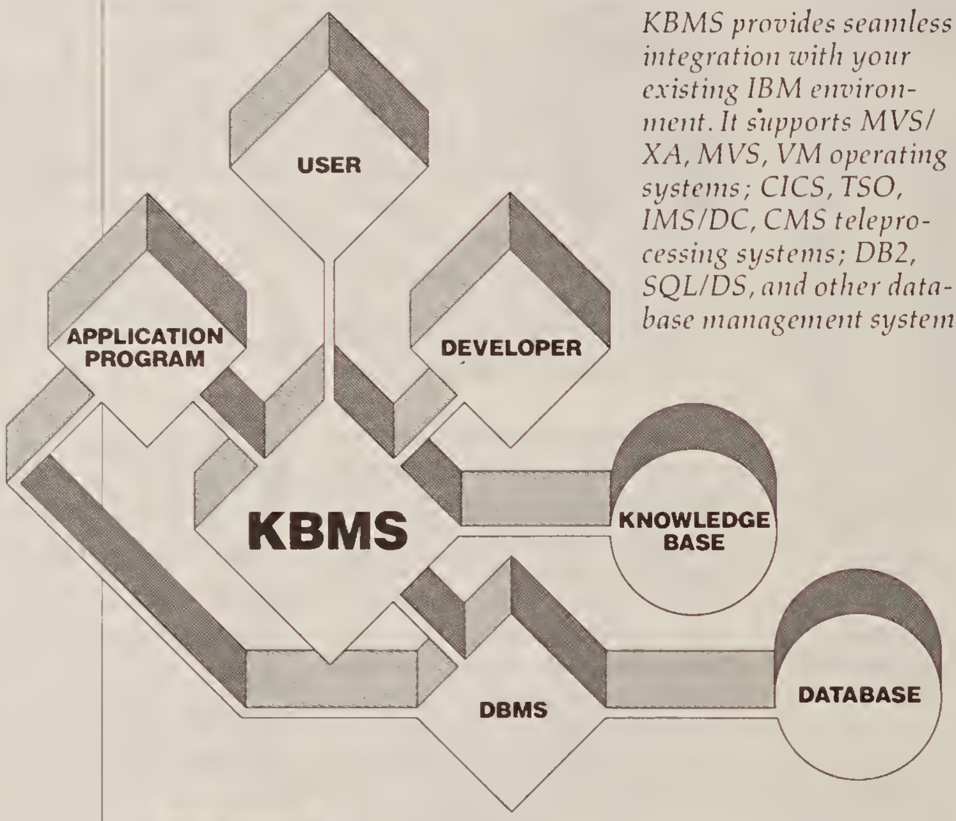

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The system runs under major IBM operating systems, teleprocessing systems and database management systems. It can be integrated with your existing applications by calling a KBMS module from a standard COBOL program, or vice versa. It even has the speed and processing power to be used in high-volume, transaction processing applications.

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Wohl

CONTINUED FROM PAGE 19

cated mixture of IBM PCs, PS/2s and clones of various brands and origins.

And then, there is the issue of applications software. There are two real reasons for wanting OS/2: For the multitasking capability; and for access to new, powerful applications, written to take advantage of the new operating environments. Both require that users acquire — and pay for — new software. We expect that an OS/2 package will, in general, cost more than a comparable DOS package.

This increased cost stems partly from the extra work required, which someone has to pay for. But it is also because software vendors expect that the break between DOS and OS/2 — with the expectations it raises of more power and, hence, more function and performance — permits a higher price.

In any case, we would expect DOS-to-OS/2 upgrades for current users of popular packages to run in the $100 to $150 range. This means that an average corporate user (with his copies of Lotus 1-2-3, a word processor and at least one more package) will see a $300 or higher price tag.

The cash cost of moving to OS/2 includes memory and board cost, plus an OS/2 cost, plus the applications software cost. The numbers show that the total average cost approaches $2,100 to $2,900 per user!

But the real cost is even higher. Installing OS/2 means removing current software and data sets, reformatting your disk, installing OS/2 and then reinstalling applications software (or replacing it with new OS/2 versions) and data sets.

In addition to a certain amount of finger-crossing and praying, installing OS/2 probably also requires some professional systems help for many users. If you pay your systems professionals $35,000 per year, apply a normal overhead factor and work the hell out of them, you would add at least another $100 per upgrade — and render the existing PC unavailable for at least a few hours.

In any case, if the availability of familiar and new applications software is what paces user demand for OS/2, then further delays are likely. There is no corporate market for multitasking on OS/2 without the availability of 1-2-3, Wordperfect's Wordperfect, Microsoft's Microsoft Word, Micropro's Wordstar, Ashton-Tate's Dbase and so forth.

None of these products is yet available on OS/2 — with the possible exception of Wordstar 2000, which has been demonstrated and will ship later this year.

In fact, if there is a current demand for multitasking, the cheapest and most satisfactory current solution is to use an operating environment tool for DOS such as Quarterdeck's Desqview or Microsoft's Windows, which permits good multitasking with current DOS packages.

It is, of course, new OS/2 software that could change the current situation. When the right application arrives in the marketplace, it will make the power of OS/2 seem obvious — and many of our cost objections will be swept away by our desire to have this new tool immediately.

In the meantime, I suspect that broad acceptance for OS/2 will lag, especially as users learn the real cost of upgrading millions of users to a new, more expensive operating environment.

Sanctions

CONTINUED FROM PAGE 18

ucation and upliftment. That way, you can make a real moral sacrifice but also get to retain your assets and your influence.

A. J. Baxter
Managing Director
Corporate Management Services Ltd.
Cape Town, South Africa

Ebony and ivory

What effect will your call for sanctions [CW, June 20] have? They will hurt a lot of people — after all, they are intended to force your opponents to obey your will. However, it is not just whites but inescapably blacks as well who will be hurt and are already being hurt.

So continue to advocate sanctions if you wish. Perhaps in the very long run you will achieve the society you are striving for.

But what is certain is that you will inflict a lot of suffering on a lot of innocent people — the very blacks you incorrectly claim you want to help.

C. Stevenson
Cape Town, South Africa

Another view

Regarding the letters from South African readers criticizing your support for sanctions [CW, June 20], readers who remember U.S. history know that similar statements were made in defense of slavery prior to the Civil War.

One writer's claim that the "real situation in South Africa is hidden from you" has a perverse ring in light of the South African government's heavy press censorship.

Even so, the picture we get of the oppressive and brutal enforcement of apartheid has brought a response from millions of Americans, including a majority of Congress.

Computerworld does us all a great service by taking a clear and strong moral stand on this important issue. After all, it would be easy for you to stick to "technical" matters.

Daniel Coleman
Chapel Hill, N.C.

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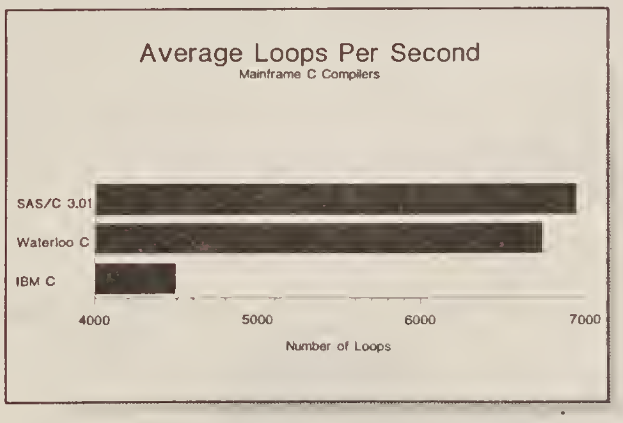

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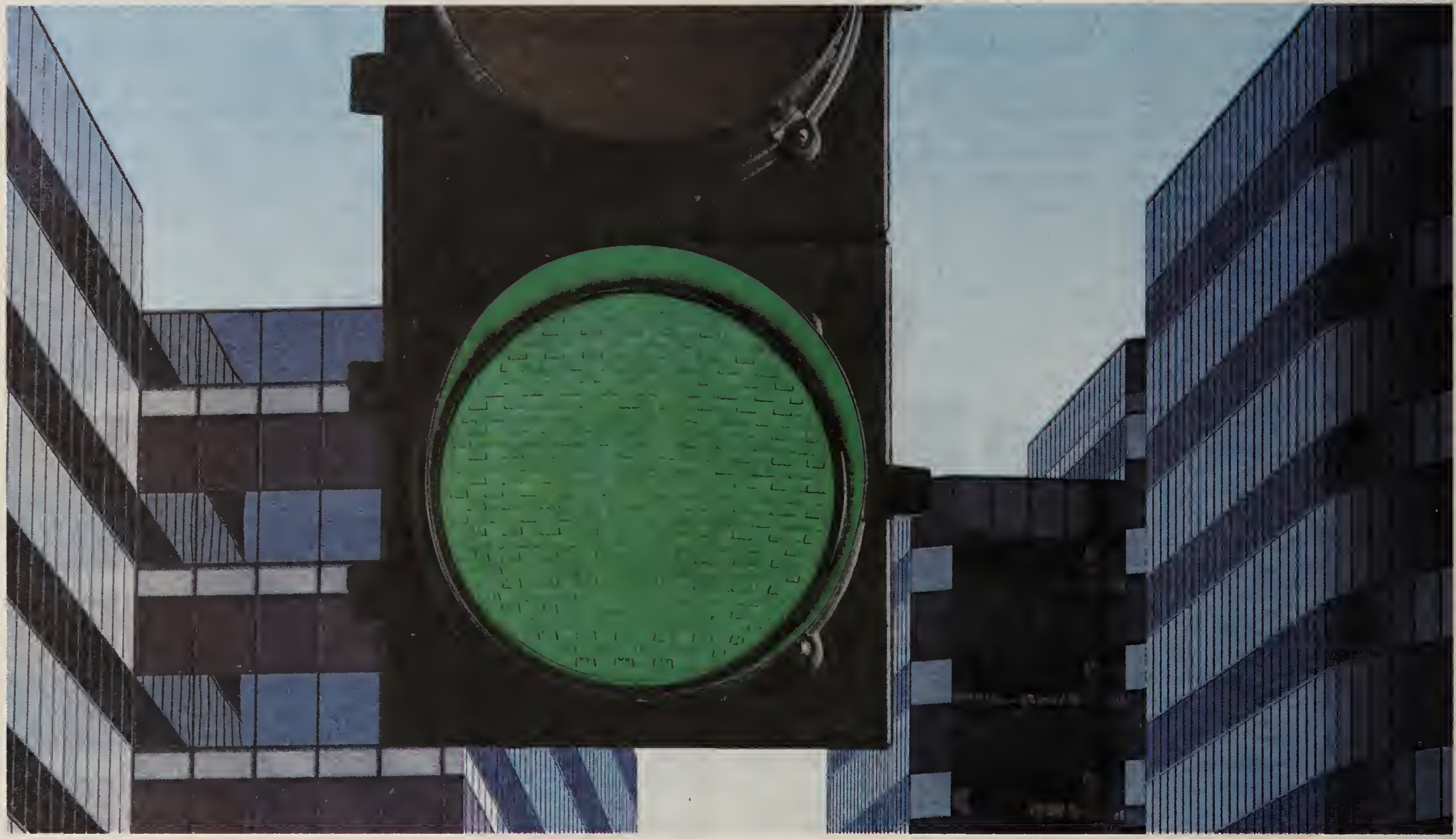

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SYSTEMS & SOFTWARE

HARD TALK

Rosemary Hamilton

Entering the survey zone

When it comes to the IBM Application System/400, we are now entering the dangerous zone of Survey Overload.

It is a useful and necessary process for market research and consulting firms to publish reports and offer advice to clients on new systems such as this IBM mid-range offering.

But it can be counterproductive when users are looking at dozens and dozens of facts and figures and opinions. Not only can we reach a point where we have almost too much information to get through, but we can end up confused. That's because when the conclusions from these various reports are stacked up against one another, we start to see different things.

So, the first question might be this: Are they all talking about the same system? The answer, unfortunately, is yes. The next, and more important, question is this: Well then, who do we believe? The answer is this: all of them and none of them. In other words, they all provide some general, helpful information. But none of them provide the final word for a user.

Continued on page 33

Sign of the times

ADAPSO finds demand high for portability

BY NELL MARGOLIS
CW STAFF

Software portability is no longer merely a tool for getting ahead in the software industry, according to a recent report issued by ADAPSO — it's a requisite for staying alive.

So avidly are users demanding portable software — in other words, software that can be transferred between dissimilar environments at low cost — that no vendor can hope to be viable without it, said the report from the professional organization of software firms.

The author, John L. Kopcke, president of Kopcke and Associates, a Manchester, N.H., firm specializing in portable software products, examined the obstacles to portable software design as well as several successful strategies for achieving it.

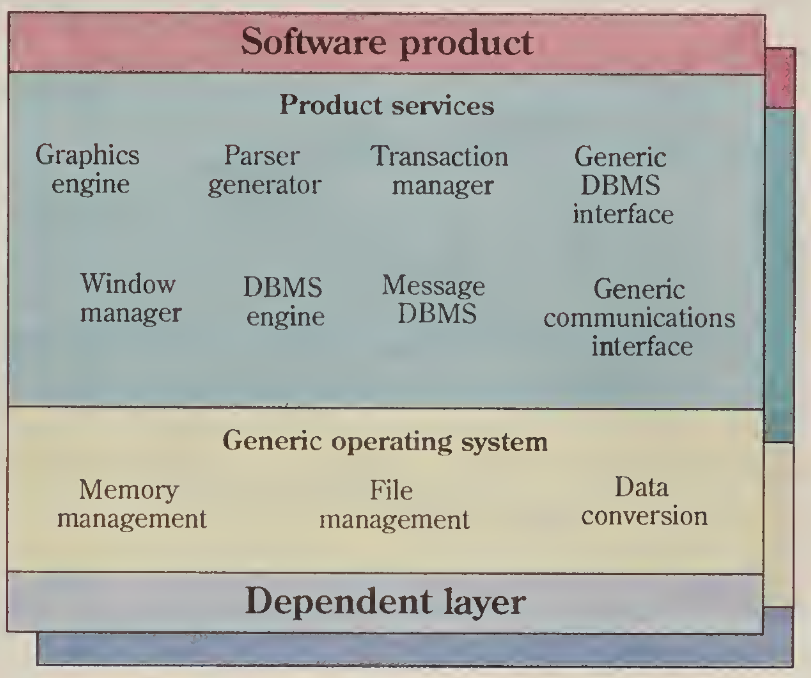
Users, the report said, find three compelling benefits in portability: It protects their often sizable investments in software; it facilitates communications on both the hardware and software level; and it enables use across national boundaries.

The proliferation of multinational corporations is prompting some countries to explore requiring that any software sold in their markets feature national language support. And dollars are speaking even where governments are silent: "The demand for national language syn-

Continued on page 36

Portability through layered architecture

DEC and IBM are pursuing portability through a layered approach: The product layer contains the code unique to the product; many products would use similar product services, interfaced to the operating system



SOURCE: ADAPSO
CW CHART

Audit cites benchmark omission

BY STANLEY GIBSON
CW STAFF

Contrary to Debit/Credit benchmark requirements, Oracle Corp. used no network- or terminal-related activity in its widely publicized benchmark results released during the summer, according to the Auditor's Report. That report, written by Tom Sawyer of the Codd and Date Consulting Group in San Jose, Calif., was recently obtained by *Computerworld.*

Oracle's Version 6 database management system tests were described as TP1 and Banking Benchmarks, both subsets of the Debit/Credit benchmark, in the document. Both TP1 and the so-called Banking Benchmark are ill-defined. Neither can be described as requiring network activity, although several of Oracle's competitors have simulated a network generating transactions in their own TP1 benchmarks.

When Oracle presented the results at a press conference July 18, the firm described the tests as TP1 but also distributed liter-

Continued on page 28

Tool converts 36 code to PCs

BY ROSEMARY HAMILTON
CW STAFF

MINNEAPOLIS — While IBM is talking about moving System/36 and 38 applications up to its Application System/400 line, a company here recently released a conversion tool to bring applications down to the microcomputer level or out of the IBM world entirely.

American Business Computer Development Systems, Inc. began shipping Convert/36, a set of tools it said will allow users to move applications written in Basic for the System/36 to micros or minicomputers running Unix, Xenix or DOS.

The programs are converted to operate in American Business' Workstation Basic operating system, the company's implementation of the Basic program-

Continued on page 35

Inside

- Some IDMS/R advice for Cullinet. Page 25.
- Storage market shifts away from IBM. Page 25.
- VM Fax adds graphics capabilities. Page 25.
- ETA Systems chalks up several customers. Page 25.

"Everyone has a plan.... until they get hit"

Mike Tyson, Undisputed heavyweight boxing champion of the world

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SOFT TALK

Robin Pasley

DB2, IDMS/R as a team

I am an experienced Cullinet IDMS/R database administrator who is becoming an IBM DB2 database administrator. In the process of learning about DB2 and talking to other users of both products, I have observed something.

Simply put, I believe that IDMS/R and DB2 are complementary products and that Cullinet is missing a great opportunity.

DB2 is thrashing IDMS/R royally in the relational database management system world, and I think that is irreversible. IDMS/R Release 11.0, should it ever arrive, will be too little too late. The architecture of IDMS/R is, at best, no better suited for ad-hoc, large-scale, set-at-a-time data access and manipulation than that of DB2, and IBM is well positioned to make DB2 better and better.

However, everyone I know who has worked with both products gives IDMS/R an advantage in planned applications where record-at-a-time access is acceptable. IDMS/R also has a strong performance advantage in cases in which Conference of Data Systems Languages, or Codasyl, set constructs are logically applicable because small groups of related data can be clustered onto a single physical page and accessed with one I/O.

Cullinet's development tool set is rated higher than the one IBM provides for DB2; ADS/Online is apparently much bet-

Continued on page 33

IBM slips in tape storage mart

Study predicts Big Blue, compatibles will drop to 50% of tape device profits

BY ROSEMARY HAMILTON
CW STAFF

By 1992, IBM and IBM-compatible tape storage products will account for only 51% of the total of tape storage revenues, according to The Technology Forums, a Chanhassen, Minn.-based market research firm that focuses on the tape storage marketplace.

Less than 10 years ago, IBM and IBM-compatible storage products, also known as IBM data interchange products, accounted for 98% of all revenues.

An emerging technology, helical scan products, could represent as much as 26% of total tape storage device revenues in five years. This year, helical scan products will account for 2% of total revenues.

The dramatic shift away from IBM-standard devices reflects the computer industry's tendency to move away from mainframes toward smaller systems, said Joe Molina, president of The Technology Forums.

"The growth is at the low end," Molina said. "Fewer mainframes mean less IBM data interchange."

IBM data interchange products date back 36 years, when IBM first introduced reel-to-reel systems. IBM tape storage competitors, such as Storage Technology Corp. and the IBM plug-compatible mainframe vendors, followed the IBM specifications on storage products, thereby allowing "interchange" of the various vendors' products.

The Technology Forums' report stated that a low-cost, low-performance version of the IBM 3480, its popular ½-in. tape cartridge, is currently the key ingredient to stir up the IBM data interchange market. When IBM releases such a product, competitors will follow suit. However, IBM is not expected to ship a low-cost and low-performance version for up to two more years.

IBM's deal with Cipher Data Products, Inc., which would have brought such a product to market under the IBM name, was renegotiated earlier this year. Cipher recently released the product under its own label.

Meanwhile, IBM is said to have its own low-cost, low-performance version of its 3480 under development internally, The Technology Forums report claimed.

While the IBM data interchange segment may be waiting for this necessary stimulant, the helical scan market segment should begin to prosper. Helical scan technology promises higher capacity and lower cost than current storage technologies possess. Several companies are either about to deliver or to announce products in this area.

Continued on page 37

VM Fax upgrade to handle graphics

BY MITCH BETTS
CW STAFF

RESTON, Va. — Systems & Telecoms, Inc. will soon begin shipping a new version of its software package for sending facsimile messages, including graphic images, from IBM mainframe and mid-range systems.

The vendor said VM Fax Release 2.2, available beginning Sept. 30, will be fully compatible with IBM's Graphical Data Display Manager (GDDM) image format. The price will be roughly $19,000 for mid-range systems such as the IBM 9370; there will be no extra charge for existing VM Fax customers.

VM Fax, part of the VM Messenger family of products, is typically used to send messages from IBM terminals to outside facsimile machines and to keep detailed logs for management reports, the vendor said.

Larry DeForest, director of MIS at Skil Corp., a power tools maker in Chicago, said his firm uses VM Fax on an IBM 4381 mainframe, primarily to send facsimile copies to overseas suppliers. After nearly three months of use, DeForest said, more than 1,000 facsimile copies have been sent by the company's purchasing staff.

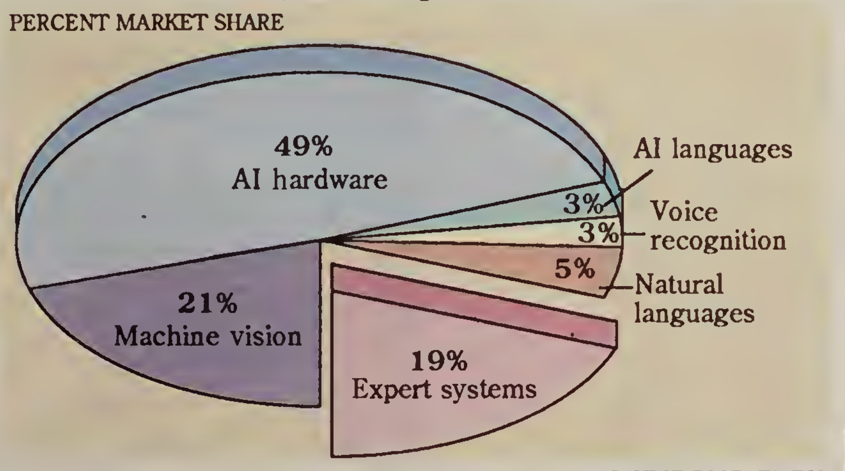
DeForest said the software

Continued on page 37

Data View

AI expertise

Expert systems have carved out a major share of the total market for artificial intelligence products



SOURCE: DM DATA, INC.
CW CHART

HARD BITS

ETA signs $11M worth of contracts

ETA Systems, Inc., a subsidiary of Control Data Corp., announced six contracts it recently won for its air-cooled supercomputers. Altogether, they total $11 million. The new customers include the following: Veritas Seismic Ltd., a petroleum exploration company in Alberta, Canada; The Australian Bureau of Meteorology; the management unit of the Mathematical Model Agency in Brussels; ENR, a computer center in the Netherlands; the Academica Seneca in Taiwan; and the Lyndon Johnson Space Center of NASA, located in Houston.

General Dynamics Corp. recent-

Continued on page 36

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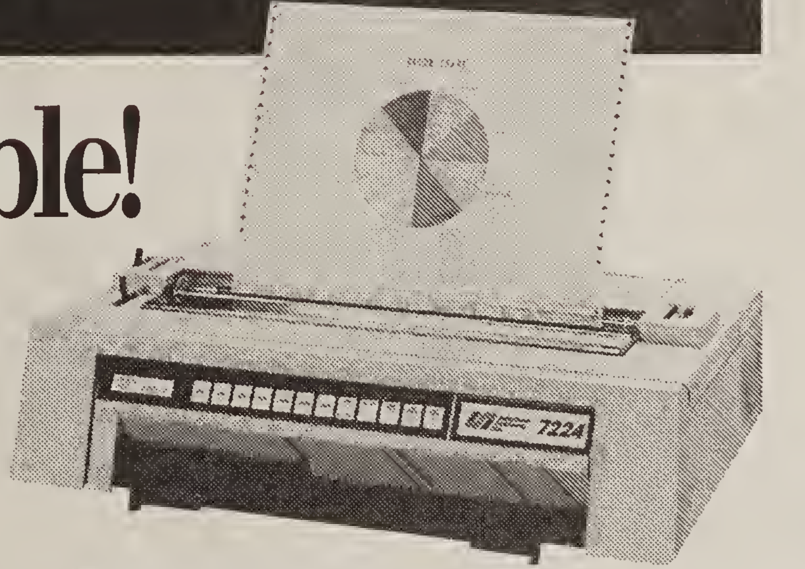

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Audit

FROM PAGE 25

ature in which Debit/Credit and TP1 were described as the same.

"They are really essentially the same. We chose the name TP1 arbitrarily," said Gordon Smith, senior product manager at Oracle. He claimed that neither Debit/Credit nor TP1 is yet formally defined and said that, speaking loosely, it is possible to use the two terms interchangeably.

He said the network component was excluded from the tests Oracle conducted because a network is not required to demonstrate database performance. In addition, setting one up for each test is very costly.

"What we want to show is how our database performs, not how well a network vendor does," Smith said, adding, "It is possible there is a performance penalty if you include the network component."

The whole truth

At the press conference, Oracle claimed the test was audited by Tom Sawyer of Codd and Date, but Oracle issued only a summary of the full report. In the full report, Sawyer noted the following "common deficiencies" not listed in the summary:

- There was no simulation of a terminal network with the associated operator think times — that is, the amount of time it takes a teller to greet a customer and understand the nature of the transaction to be performed.
- There was no network- or terminal-related activity on the measured machine. Implementing the driver software as an integral part of the transaction allowed benchmarking on several platforms to have fewer complications than a driver machine implementation.

"However, I feel this lack of terminal or network activity improved the throughput over a driver-machine implementation; I have no idea by how much," Sawyer commented.

- The log file was not duplexed. Although not required for TP1, this would have been required for Debit/Credit.

Omri Serlin, president of Itom International, Inc. in Los Altos, Calif., said he believes that Debit/Credit results ought to have a certain number of transactions per second deducted if the test performed does not measure up to the Debit/Credit standard.

A deduction would correspond to the number of discrepancies between the test conducted and the Debit/Credit standard. A subset of Debit/Credit, such as TP/1 or Banking Benchmark, would thus carry a discounted figure for transactions per second.

Serlin is organizing a group, called the Debit/Credit Council, to arrive at a Debit/Credit industry standard.

In the conclusion of his audit, Sawyer noted that benchmarking requires long hours and many traumas. "I congratulate Oracle developers on their efforts in getting Version 6.0 with Transaction Processing Subsystem to where it could be benchmarked on not one but four platforms."

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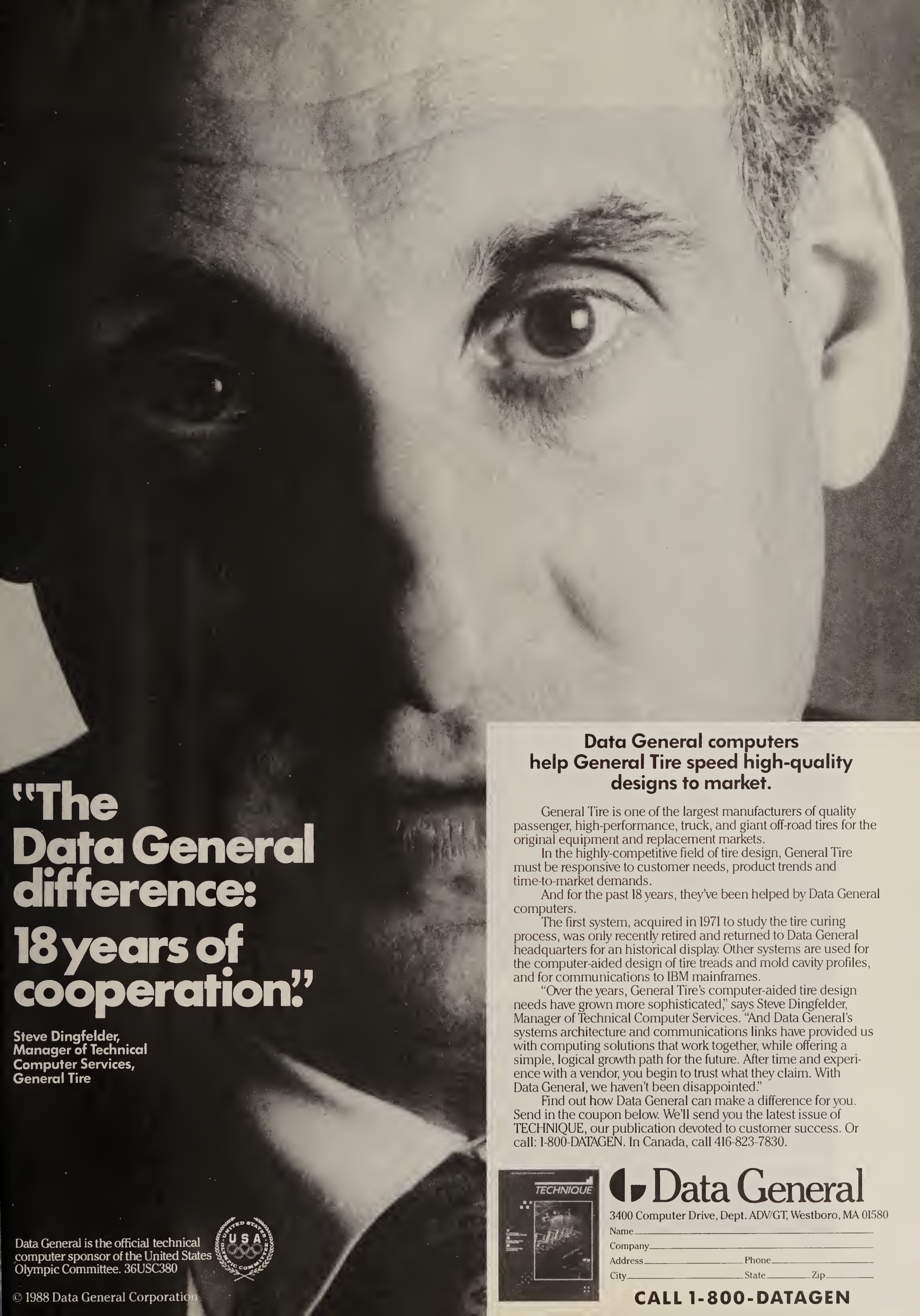
Emerald touts AS/400, PC file transfer

BOTHELL, Wash. — Emerald Technology, Inc. announced it has adapted an IBM System/36 and 38 file transfer product for use with the IBM Application System/400 minicomputer.

Emulator Transfer Utility/400 (ETU/400) is derived from Emerald's ETU/300 series software program, which is used for file transfer between System/36s and 38s and IBM Personal Computers and Personal System/2s. The program can be used for file transfer in conjunction with word processing and spreadsheet software or with relational database programs.

ETU/400 also offers resource sharing and faster printing for PC users, according to the vendor.

Currently available, the ETU/400 is priced at $950.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"Over the years, General Tire's computer-aided tire design needs have grown more sophisticated," says Steve Dingfelder, Manager of Technical Computer Services. "And Data General's systems architecture and communications links have provided us with computing solutions that work together, while offering a simple, logical growth path for the future. After time and experience with a vendor, you begin to trust what they claim. With Data General, we haven't been disappointed."

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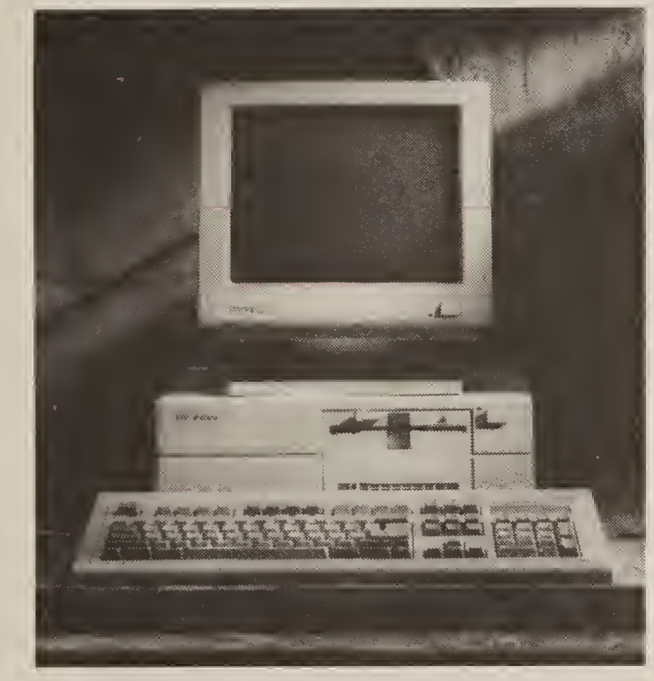

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Open Software
FOUNDATION

Pasley

FROM PAGE 25

ter than IBM's Cross System Product for doing serious development, and Cullinet's dictionary is touted by every database administrator with whom I have spoken as the best on the market.

Since IDMS/R is a great engine for high-volume transaction processing or preplanned, clustered access, and DB2 is a great engine for unplanned, ad-hoc types of queries, why can't they be used together?

They can, but there are two problems in doing so:

- Often the same data is needed for end-user applications and transaction processing. The process of retaining synchronization across multiple copies of the same data is both complex and resource-intensive, and a lot of companies just can't cost-justify it. Many would benefit from a development environment that could access data from either IDMS/R or DB2.
- No ADS/Online-like application development tool exists that can address both DB2 and IDMS/R from the same application. IMS and DB2 can be synchronized because they share the same external journaling mechanism. Perhaps something similar could be done for IDMS/R and DB2.

These two problems seem to represent a large opportunity for Cullinet. If the journaling issue can be resolved and the Cullinet dictionary and DB2 catalog linked invisibly behind the scenes, and if programs in the IMS/Data Communications region can use cross-memory services to access DB2 — the same way that programs in a CICS or IMS region do — Cullinet products could continue to offer the same value they do now, plus the added value of a clean DB2 interface.

Release 10.2 of IDMS/R is a step in the right direction, as SQL syntax is now part of Cullinet's Online Query product. But both Cullinet's Data Manipulation Language (used with IDMS/R) and its SQL must be mixable in a production application that will use both IDMS/R and DB2. If Cullinet can include support for DB2, they will get back in the black and stay there.

Pasley is database administrator at Glaxo, Inc. in Research Triangle Park, N.C.

Hamilton

FROM PAGE 23

As of this writing, four AS/400 reports sit on this desk, and soon more will be added to this stack.

Here are some examples of survey results:

- Focus Research Systems released survey results based on interviews with 95 sites that are planning to purchase an AS/400. The company wrapped up its report by stating, "The initial response to this machine has been very positive . . . It looks like IBM has a winner here."
- Forrester Research released a report that says, "Despite the marketing hype surrounding its rollout, Forrester does not believe that the AS/400 will be the home run that IBM is looking for at the mid-range."
- The Sierra Group's conclusions fall somewhere in-between. It says the system is not the price/performance dynamo that IBM would like us to believe. In fact, it looks like a loser when compared with DEC VAXs at the high end of the product line.

On the other hand, it continues that this new product line is very important, indeed. "The AS/400 heralds a new era — and serves notice on competitors that the giant of Armonk will soon expand its presence beyond the accounts it knows best."

Rather than suffer from survey overload, users should keep just one thing in mind: The reports can help paint a general picture of the AS/400. The AS/400 users, most of whom are just now installing their systems, are the ones who can soon provide the real facts about the system.

Hamilton is *Computerworld*'s senior editor, systems.

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SOFT NOTES

Apollo stations tap database system

Apollo Computer, Inc. recently said that G-Base, an object-oriented database system, will be ported to Apollo's Personal Workstations and Personal Super Workstations under a joint marketing agreement with **Graphael**, the maker of G-Base. Graphael specializes in knowledge-based data management solutions for industrial applications.

A recent U.S. Department of Labor contract won by **Unisys Corp.** will include the relational database management system of **Informix Software, Inc.** running on Symmetry Systems from **Sequent Computer Systems, Inc.** Included will be Informix-Turbo, Informix's on-line transaction-processing database engine.

Sequent, acting as a subcontractor to Unisys, will provide its Symmetry systems in 13 regional offices for on-line claims processing for the Federal Employee Compensation System.

Polygen Corp. in Waltham, Mass., and **Hewlett-Packard Co.** recently signed a joint development agreement under which Polygen will convert its molecular graphics, simulation and research documentation software systems products to operate on the entire range of HP-UX technical workstations. These products will be marketed to the chemical and pharmaceutical research industry, according to both firms.

Included are Polygen's Centrum, Quanta and Charm research automation application software products and all HP 9000 technical and graphics workstations.

Verbex Voice Systems, Inc. in Cedar Knolls, N.J., recently unveiled a voice-input system designed for manufacturing personnel. The system allows users to input comands to personal computers, minis and mainframes. It also allows users to manufacture instruments and controllers using continuous voice input.

The Verbex Manufacturing Control System also permits operators to confirm that the input was correct by hearing a spoken message. Configurations for a number of manufacturing applications, including quality control process control, materials handling and inspection are available, Verbex said.

Arthur Andersen & Co. said recently that its strategic services consultants will use the Compete business strategy support system, made by Stamford, Conn.-based Manageware, Inc. The package will be used by Arthur Andersen's 250 strategic services consultants in 12 worldwide locations.

36 code

FROM PAGE 23

ming language that it said runs in the Unix, Xenix and DOS operating environments. Current platforms supported include the IBM Personal System/2, the NCR Corp. Tower XP series, the AT&T 3B line and Altos Computer Systems, Inc. microprocessor-based systems.

The company said it will measure how Convert/36 does in the market before deciding to develop a companion product for System/38 users.

American Basic recommends that only experienced System/36 programmers use Convert/36 because some manual conversion will be required in the porting procedure. This would occur with instructions within an application that are not recognizable to the Convert/36 software, such as user modifications.

But the company stands by a claim that 90% of a given program can automatically be converted.

Convert/36 carries a license fee of $1,500. The Workstation Basic programming environment starts at $695.

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Hard bits

CONTINUED FROM PAGE 25

ly picked up a Butterfly-Plus, the parallel processing system made by **BBN Advanced Computers, Inc.** in Cambridge, Mass. The 12-node system, which has Fortran and C compilers, costs about $190,000.

Butterflies are configured with nodes with an estimated rating of 2.5 million instructions per second and 4M bytes of globally shared memory each. BBN said the agreement between the two companies calls for additional Butterfly purchases at an unspecified date.

Mizar, Inc. in Carrollton, Texas, said it will purchase $1.5 million worth of **Sun Microsystems, Inc.** Sun3-E/Eurocard CPU boards. The Texas company plans to develop a new Unix-based system with real-time development tools. The Sun board is based on the Motorola, Inc. 68020 microprocessor and the Sun Operating System.

Storage Technology Corp. said its 4480 Cartridge Subsystem can now be used with the **Cray Research, Inc.** Cray X-MP, Cray Y-MP and Cray-2 processors. The companies also hatched a development agreement that will give Cray users access to the Storagetek 4400 Automated Cartridge Systems library using the Cray MVS- and VM-station software and Storagetek's host software components.

Meanwhile, the first **Cray Y-MP** computer was delivered to the NASA Ames Research Center in Moffet Field, Calif. NASA's order for Cray Research's most advanced system was announced in June. The system will replace one of the two Cray-2s at the site. It will be used for simulation of advanced aerodynamic design after a period of testing.

Datalease Systems and Financial Corp. said it released the XLN03 Personality Cartridge, which enables a Xerox Corp. Model 4045 laser printer to emulate a DEC LN03 printer.

IBM is expected to use high-speed gallium arsenide logic chips in its mainframes by 1995 or '96, according to International Technology Group, a market research firm in Los Altos, Calif. The chips will first appear in the mainframe line to be introduced to replace the 3090 series. The new line will also feature reduced instruction set computing technology, a distributed I/O bus structure featuring high-speed peer-to-peer communications and a form of parallel processing. IBM will thus follow **Cray Research, Inc.**, which is committed to producing a gallium arsenide supercomputer in 1989.

Recognition Equipment, Inc. and **C. Itoh & Co.** in Japan have signed a marketing agreement that gives the Japanese company the rights to sell the Dallas firm's Tartan Plus Terminal System in Japan.

Sign

CONTINUED FROM PAGE 23

tax is so important," said the report, "that products with substantially less functionality are being chosen over more functionally capable English-language products." Caveat vendor.

Developers are latecomers to the cause, the report noted. Nevertheless, they too have a laundry list of benefits to be gained from creating portable software: maximum return on development investment, rapid entry into new markets, reduced support and documentation costs and protection of the customer base, to name but a few.

It is a lot easier to make the case for portable software than to make portable software. Software is portable, the report said, only if it provides a consistent user interface across all environments; identical command syntax in the user's native language; identical functionality regardless of environment; ready exchange of data across all operating environments; no significant time lag between versions for different environments; and both hardware and software integration.

Moreover, the report noted, a number of hurdles await the portability seeker. Some — such as multinational syntax, messages and text; differing date, time, and currency; and character sets — are placed in his way by the user. Others, such as disparate file management services, communications, error handling, device interfaces and memory management, are a function of the operating system.

Three strategies have been commercially successful in overcoming enough of the obstacles to deliver portable software, the report said:

- Conceptual portability (or Play it again, Sam — this time on a VAX). This involves rewriting the product for each environment to which it is ported. The report calls it "a maximum-cost solution," requiring a large and multiskilled development staff, much time, hard-to-control implementation, long development cycles for each port, an awesome quality-assurance effort and significant access to target machines. On the positive side, it involves no new technology and is an easy sell to developers — no mean achievement, according to the report. It also ensures optimal performance in each environment.
- Layered software architecture, or the implementation of an invariant core that isolates a software product from its host environment. An increasingly popular approach, this do-it-yourself strategy offers multiple efficiencies: a single set of source code, easily coordinated version releases, improved quality assurance and short development cycles. It allows for programmer specialization and requires minimal access to target machines. It supplies a ready portability base for new products.

But it also comes with a double price tag: The development of the new kernel takes up-front time and money, and the approach involves new technology and a new mind-set, which could prove difficult to sell to the development staff.

- Off-the-shelf development and execution environments, including: tools and components such as application generators, fourth-generation languages and database management systems. "This strategy of *letting someone else worry about it* is the most successful approach for organizations developing portable application software," the report said. It, too, can be hard to sell developers for whom either the technology or the methodology involved is a deviation from their entrenched ways.

In addition, it makes the user dependent on another software vendor, risks being the least efficient of all the solutions and is the least tailored to the user's hardware platforms and software environments. On the other hand, this is the "minimal-cost solution," and that alone could prove persuasive.

Both Digital Equipment Corp. and IBM have taken a layered architecture approach, with Application Environment and Systems Application Architecture, respectively. The portability sought by both is across their own product lines.

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Tape storage

FROM PAGE 25

Gigatrend, Inc. recently announced it is delivering the Giga 1200 Tape Storage System, which records data on 4-mm digital audio tape cassettes. The product is said to store from 1.2G to 8.4G bytes of data.

In the helical scan segment, a few factors could hold back growth. Most importantly, there is no set format or interface standard among suppliers.

In the IBM data interchange market, revenue that could have been gained from this expected new 3480 will be diverted to the current IBM 3480 products and to reel-to-reel products, The Technology Forums reported.

To a lesser extent, non-IBM ¼-in. data cartridge products will also pick up revenue that would have gone to the 3480.

Although the new 3480 will not be available for two years, other advances will be made in this market segment, the report found. Lower cost versions of both types of 3480s, the 1,500K bit/sec. and 300K bit/sec. models, are expected from Aspen Peripherals Corp. in Longmont, Colo., and Storage Technology.

In addition, IBM is expected to release both higher capacity versions of its 3480 as well as a version with higher transfer rates. The higher capacity version, which will be achieved with data compression technology, should be released later this year, the report stated.

IBM will still support reel-to-reel products although they are often considered a dying approach, Molina said. The report noted that with the recent Application System/400 announcement, IBM said the new midrange would support at least two reel-to-reel products.

VM Fax

FROM PAGE 25

has become popular at Skil because employees no longer need to feed the facsimile machine manually.

At the receiving end, DeForest said, the facsimile copy is much sharper because it is a digitally produced image rather than a scanned image. "The clarity is unbelievable," he said. "It's almost as clear as a photocopy."

DeForest said that GDDM support is a welcome addition because it will allow Skil to receive facsimile copies with graphic images. "We can't receive faxes now because we don't know whether they will have graphics in them," he said. He plans to use Release 2.2 to receive facsimile copies and then use electronic mail to route them to the proper terminal.

According to the vendor, received facsimile copies can be displayed and manipulated on graphics terminals and printed on any GDDM-compatible printer. Outbound facsimiles can include GDDM images, the company letterhead, logos and signatures.

Altos adds to low-end line

SAN JOSE, Calif. — Altos Computer Systems, Inc. added to its Intel Corp. 80386-based multiuser line recently with a low-end system that can support up to eight users.

The Altos 386 Series 500, introduced late last month, now serves as the entry-level model to the 80386-based product line. It can support either Microsoft Corp.'s MS-DOS or Altos' implementation of AT&T's Unix System V, Release 3.

The company's other 80386-based systems include the Series 2000, which can be configured with up to 16M bytes of main memory and can support up to 64 users, and the Series 1000, which supports between eight and 24 users.

The Series 500 will be offered in four configurations that range from 2M to 16M bytes of main memory and 40M to 70M bytes of hard disk storage. Eight serial I/O ports and a 60M-byte streaming tape drive are optional.

The company said the system will be sold through value-added resellers, but the typical end-user prices will range from $4,000 to $10,000.

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NEW PRODUCTS — SYSTEMS

Processors

Sky Computers, Inc., a cooperative marketing partner with Digital Equipment Corp., has unveiled an enhanced version of its **Sky Warrior-Q/20** array processor.

The product reportedly offers 20 million floating-point operations per second processing speeds, larger I/O buffers and easier programming capabilities for DEC's Microvax II and Microvax 3500 and 3600 computers. The I/O buffer memory has been increased from 2K to 8K bytes, the vendor said. The processor also incorporates a library of vector subroutines that can be executed from Fortran or C language programs. The product works within DEC Q-bus hosts as a master/slave device.

The Sky Warrior-Q/20 is priced from $12,900.

Sky Computers, St. John St., Lowell, Mass. 01852. 617-454-6200.

Data storage

Dataram Corp. is offering a memory-board upgrade discount plan for users of Data General Corp.'s MV series computers.

Under the new quantity discount plan, user discounts begin with the second board purchased and reportedly increase to a maximum discount of 30% with succeeding purchases. The plan can also be combined with the recently announced Dataram memory trade-up program for an overall price reduction of as much as 60% on high-capacity memory-board purchases.

According to the company, the plan is useful for multiple-system users who need to upgrade main memory for several MV computers at once.

Dataram, P.O. Box 7528, Princeton, N.J. 08543. 800-822-0071.

Summus Computer Systems has announced a lifetime warranty policy for its 8-mm, high-precision magnetic media.

The company said that it will replace any of its media found to be defective, as long as they have not been damaged through misuse or handling, for the lifetime of the cartridge. The Summus 8-mm data cartridges are reportedly the recommended media for the gigatape line of helical-scan storage products. The devices can be configured in capacities ranging from 2G bytes to 1 terabyte of data.

The cartridges cost $34.95.

Summus Computer Systems, P.O. Box 219270, Houston, Texas 77218. 800-255-9638.

I/O devices

Xerox Corp., in an effort to localize font support and improve delivery of font products and services for its line of nonimpact printing systems, has opened a **Font Support Center** in Chicago.

The new office will be located in Xerox Center, 55 Monroe St., and will also provide on-site technical support to the Chicago metropolitan and suburban areas. According to the company, additional support centers are planned for other U.S. locations.

The centers will provide express turnaround on logo and signature digitization for all printers and standard fonts for the Xerox 2700, 3700 and 4045 laser printers. Fonts will be available on tape, cartridge and diskette, and most orders will be completed within 48 hours, the vendor said.

Xerox, P.O. Box 1600, Stamford, Conn. 203-329-8700.

A 20-in. color graphics terminal that provides noninterlaced 1,024- by 768-pixel resolution has been announced by **Intecolor, Inc.**

Dubbed the **AG 1024**, the product utilizes video conversion technology to achieve its resolution capabilities, the vendor said. The unit includes an Intel Corp. 80186 central processing unit for compilation of sequential high-level graphics instructions. Additional features include a hardware zoom, high-speed pixel operations for pop-up windows and 149 predefined and 100 user-defined fill patterns.

The AG 1024 costs $5,995.

Intecolor, 225 Technology Park, Norcross, Ga. 30092. 404-449-5961.

Houston Instrument Co. has discontinued several models of its **DMP series** of wide-format pen plotters, the vendor said. The discontinuation is said to be a direct result of increasing demand for the company's DMP-60 series, introduced in October 1987.

The company will cease manufacturing and marketing the DMP-41/42, DMP-51, DMP-51 MP and the DMP-56A/C. The DMP-52 and DMP-52 MP will continue to be manufactured to complement the DMP-61, DMP-62 and Houston Instrument's entire product line of automatic and manual digitizers, according to the company.

The DMP-52 and DMP-52 MP reportedly offer a resolution of 0.001 in. and a speed of 16 in./sec.; the DMP-62 plots at up 24 in./sec. The DMP-61 is said to offer a plotting speed of 32 in./sec.

Pricing for the plotters ranges from $3,295 to $6,495.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753. 800-444-3425.

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NEW PRODUCTS — SOFTWARE

System software

Venturcom, Inc. has announced **Venix/286 System V, Release 2.4**, reported to be a high-performance cost-effective version of standard AT&T Unix System V, Release 2.

Venix/286 2.4 runs on IBM Personal Computer ATs and compatible systems. According to the vendor, the system supports most time-critical applications in process control, graphics generation and on-line transaction processing. Various real-time capabilities are provided, including asynchronous I/O, preemptive priority scheduling, direct hardware access and high-resolution alarms. Version 2.4 is available as a runtime system.

The full system configuration of Venix/286 2.4 costs $800 for one or two users and $1,000 for multiple users.

Venturcom, 215 First St., Cambridge, Mass. 02142. 617-661-1230.

Development tools

American Imaging Services, Inc. has integrated its **Lunaseries** software with Autodesk, Inc.'s Autocad and optical disk technology to convert traditional drawing methods to a computer-aided design (CAD) system. The integrated system will provide the necessary tools to optically scan, edit, store and manage hand-generated drawings, the vendor said.

The software is composed of three packages: **Lunalink**, **Lunaedit** and **Lunalibrarian**.

Lunalink is said to allow the loading of scanner raster files into a personal computer running Autocad software. The package incorporates internal compression and decompression routines that allow for the storage of raster images. Lunalink costs $995.

Lunaedit is a set of tools for editing the raster image and merging both raster and Autocad files for electrostatic plotting. The package costs $495.

Designed to manage a CAD library, Lunalibrarian is said to combine a data base management system for CAD files with optical disk technology. According to the vendor, data storage costs are approximately 25 cents per megabyte. Lunalibrarian costs $695, not including the optical disk system.

American Imaging Services, 2315 Luna Road, Carrollton, Texas 75006. 800-234-7226.

Intermetrics, Inc. has expanded its **Intertools** line to support Hewlett-Packard Co.'s HP 64700 stand-alone emulators.

The Intertool software is said to incorporate C cross-compilers, cross-assemblers, XDB source-level cross-debuggers and utilities specifically designed for programming embedded microprocessors.

According to the vendor, a transparency mode allows access to the HP 64700's command structure, and record and playback commands allow the user to recreate a debugging session at another time.

The software is targeted to perform on the Motorola, Inc. 68000, the Intel Corp. 80186 and Zenith Data Systems Z-80 microprocessors. Intertool ranges from $800 to $1,500.

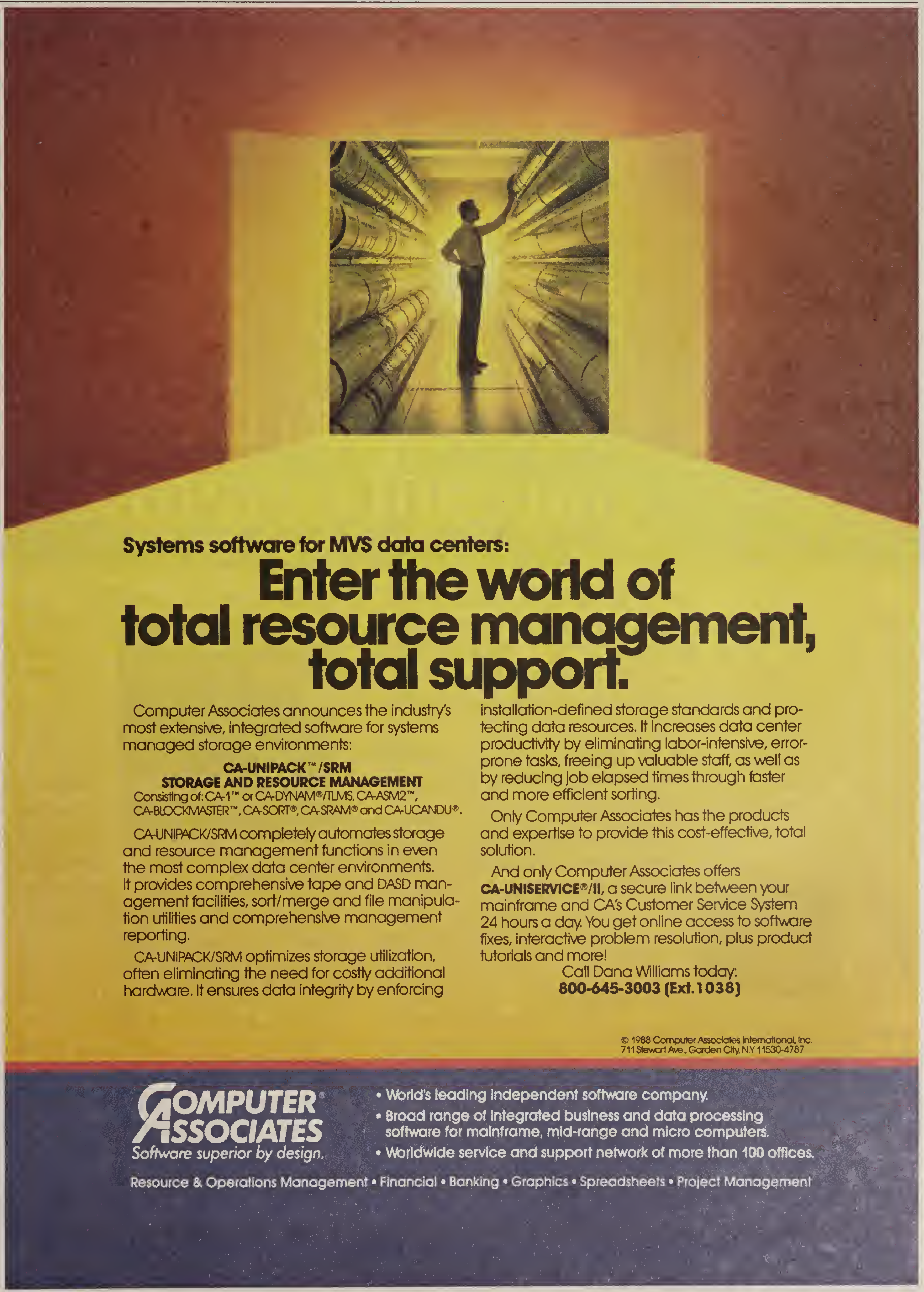
Intermetrics, 733 Concord Ave., Cambridge, Mass. 02138. 617-661-0072.

A computer-aided software engineering tool capable of producing Cobol and CICS code has been introduced by **Synoptic Consulting, Inc.**

Called **RAP** (Rapid Automatic Program-Maker), the product is a menu-driven application generator developed in Sweden. It is microcomputer-based; source code is uploaded to the mainframe for compilation. An IBM Personal Computer AT or compatible with IBM PC-DOS 2.1 or higher and a 10M-byte hard drive are required.

RAP costs $2,995.

Synoptic Consulting, 10 E. 39th St., New York, N.Y. 10016. 212-779-1588.



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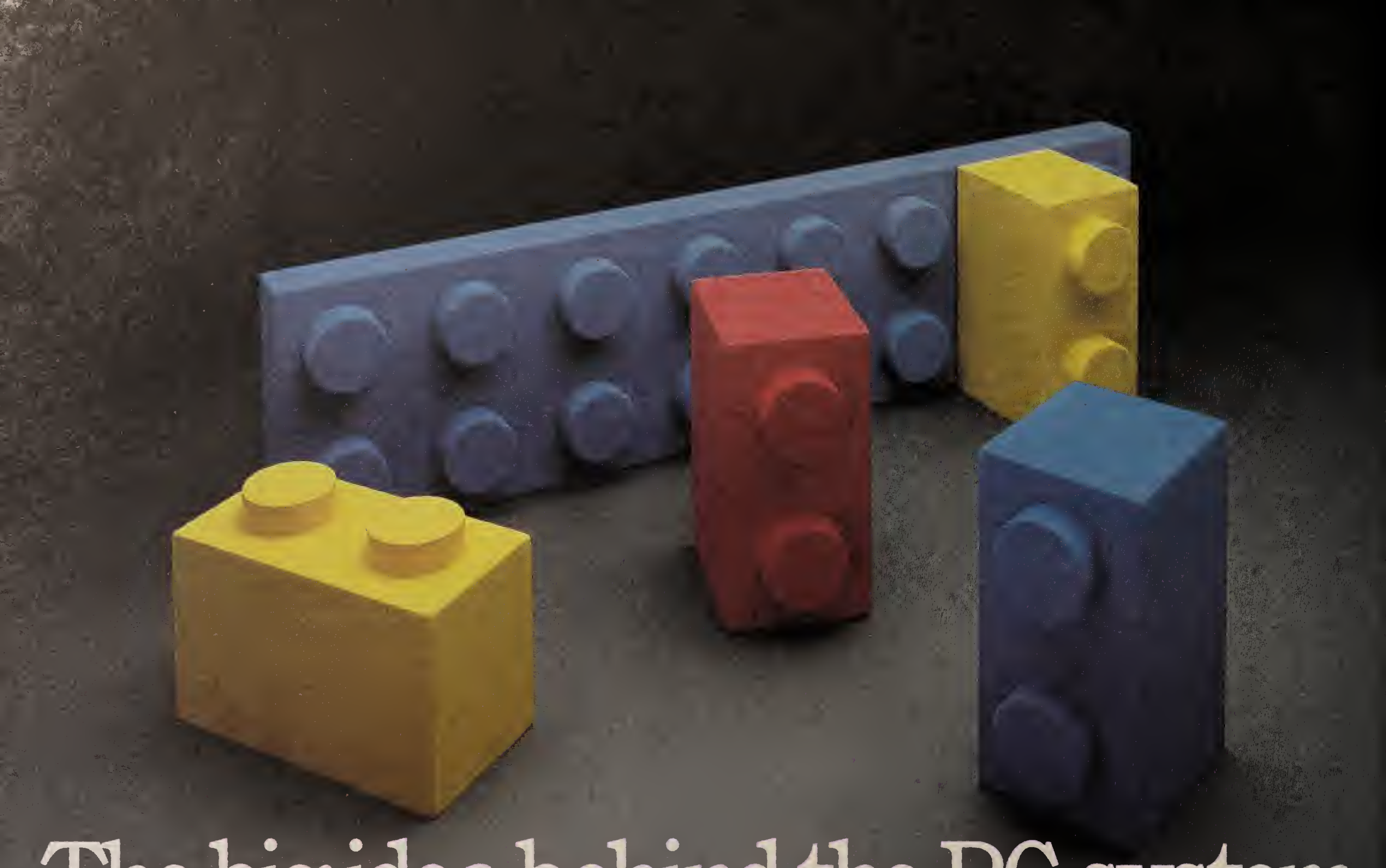

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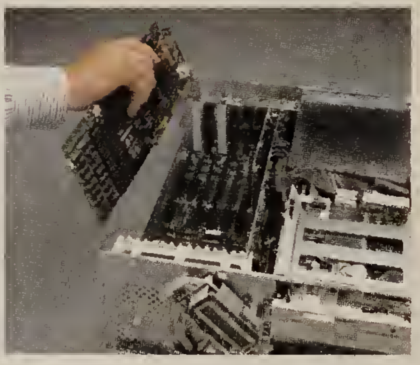

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A computer-aided software engineering (CASE) tool has been introduced by **Advanced Technology International, Inc.**

Supercase provides an open-architecture CASE tool for the Ada environment and includes facilities for C, Fortran, Pascal and other languages, the vendor said.

The product will generate code directly from design and then provide facilities to complete that code. It includes a support environment for integration and testing as well as an environment for all maintenance activities.

Currently available for operation in a Digital Equipment Corp. VAX/VMS environment, Supercase costs from $15,000 to $85,000, depending on VAX model, languages and other options selected.

Advanced Technology International, Suite 2420, 350 5th Ave., New York, N.Y. 10118. 212-947-4755.

A series of Fortran programming tools that reportedly facilitate Fortran code debugging, maintenance, portability and development has been announced by **Integrated Systems Technologies, Inc.**

Toolpac 2.4 is said to include a Pfort 77 ANSI standard verifier and is available for Unix, Digital Equipment Corp. VMS and IBM systems.

Toolpac 2.4 costs $500.

Integrated Systems Technologies, Suite 220, 1555 Sherman, Evanston, Ill. 60201. 312-869-3038.

McDonnell Douglas Information Systems Co. has introduced an enhanced version of its **Pro-IV** application development language.

Version 1.5 permits MIS organizations to develop applications that are portable across mainframe, mini and microcomputer platforms. Features include full field updating, expanded screen design capacity and more logical screens. Applications developed with Pro-IV are portable across several platforms, including the IBM 4300, 3080, 3090, System/36, Personal Computer and Personal System/2; Digital Equipment Corp.'s VAX and Microvax series; and AT&T's 3B1 and 3B2.

Pro-IV ranges from $2,000 for a personal computer version to $100,000 for a mainframe version.

McDonnell Douglas, P.O. Box 516, St. Louis, Mo. 63166. 314-232-0232.

NIS, Inc., has announced a cooperative marketing agreement with **Sybase, Inc.** in Berkeley, Calif., to promote Sybase's **SQL Server** and the NIS fourth-generation language (4GL) **Accent R.**

The new product packaging agreement is aimed at users of Digital Equipment Corp. VAX machines to provide both a sophisticated 4GL and database management system in an SQL environment, the vendor said. To be used primarily for on-line transaction processing applications, the products will be linked with the **Accent R SQL-gateway** interface.

Price ranges from $2,475 to $122,025, depending on CPU.

NIS, 1190 Saratoga Ave., San Jose, Calif. 95129. 408-985-7100.

Applications packages

A generalized date-handling and formatting-routine software is available from **Act Softools, Inc.** The package, called **Dateline**, is an assembler module and can be called from high-level language programs, the vendor said.

The product was designed to free programmers from the time-intensive coding and testing required for date-handling operations. Features include date validation and format conversion, support for the year 2000, a leap-year indicator, a day-of-the-week indicator and textual day-of-the-week and name-of-the-month indicators. The product is available for mainframe environments.

Dateline costs $3,000 for a single-CPU license in IBM PC-DOS and VM environments and $4,000 for a single-CPU license for IBM MVS and ESA.

Act Softools, P.O. Box 415, Youngsville, N.C. 27596. 919-556-1012.

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   - 65. Communications Systems/Public Utilities/Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
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   - 75. User Other ____________
   - 95. Vendor Other ____________ (Please specify)
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   - 31. Dir., Mgr., Suprv., of Programming
   - 32. Programmer, Methods Analyst
   - 35. Dir., Mgr., Suprv., OA/WP
   - 38. Data Comm. Network/Systems Mgt

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr
   - 12. Vice President/Asst VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech Mgt
   - 51. Sales/Mktg Mgt

   OTHER PROFESSIONALS
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Douglas Barney

Lotus has not begun to fight

1-2-3, you're out? If you listen to the critics, Lotus is in pretty rough shape. Product timetables are slipping, and key executives are either jumping ship or getting pushed overboard. Even worse, savvy competitors have, or are planning, a raft of products better than today's 1-2-3.

Lotus has taken licks from the media in what can safely be called a public relations nightmare, and Wall Street has pushed Lotus stock to an embarrassing low.

Where Lotus used to be called arrogant for the smug way it dealt with success, it is now called directionless, uncreative, undisciplined. For many, Lotus is like Lenny, the dim-witted giant in *Of Mice and Men* who couldn't do anything right except lift hay.

What critics sometimes forget is that Lenny was so strong that he snapped the necks of pet mice just by stroking them. It seems even easier for Lotus to kill competing products.

Many supposedly superior packages have squared off against Lotus, but the names have faded a bit with time. Still,

Continued on page 68

Ventura tries to stay on top

BY STEPHEN JONES
CW STAFF

SAN DIEGO — Pacesetter Xerox Corp. attempted to stay on top of the desktop publishing market last week by announcing an upgrade to Ventura Publisher as well as two products designed to boost its performance and give multiple users access to the same document.

The $895 price of Ventura Publisher 2.0, set to be available in October, is the same as its predecessor. However, users seeking more advanced capabilities can expect to pay an additional $595 for a software package that takes advantage of high-performance Intel Corp. 80286- and 80386-based personal computers.

Called Professional Extension, the program includes Lotus/Intel/Microsoft Expanded Memory Specification support and boosts Ventura Publisher 2.0's performance to include vertical page justification, a table-edit mode that lets a user quickly insert cells into a document and a 130,000-word hyphenation dictionary.

The core 2.0 program is capable of importing information from a database or spreadsheet and typesetting the data. It can also anchor pictures in a body of text, automatically paginate a document and cross-reference information, the vendor said.

Half-and-half?

John Meyer, president of Ventura Software, Inc. — which developed the product — predicted that about half the users buying the upgrade will also purchase the Professional Extension software. Registered users can upgrade to Ventura Publisher 2.0 for $100.

Ventura Publisher 2.0 is aimed at heading off any threats from rivals such as Aldus Corp. that are trying to knock Xerox from its market-leader postion in the desktop publishing market for DOS-based personal computers. Market research shows that the company shipped about 200,000 copies of Ventura Publisher 1.1 in 1987.

Meyer claimed that the package's optional Network Server is the first server software designed specifically for concurrent multiple users working with the same desktop publishing document on a local-area network.

Network Server can be purchased as a package with Ventura Publisher 2.0 for $1,295. All three products are scheduled to be available by the end of October.

Secure PCs from virus attacks

ANALYSIS

BY JON DAVID
SPECIAL TO CW

You boot your PC. Maybe it's first thing in the morning, maybe it's after lunch — it doesn't matter when.

You get a beep, a few words from DOS and whatever pop-ups you're using — maybe another beep. Then it happens.

A message on the screen. (You may even get a graphic with the message, but it's not necessary). The message? "Merry Christmas," "This will

Continued on page 67

Colman: *'We've built the fastest monohull on earth.'*

Tech's losing edge?

BY ALAN J. RYAN
CW STAFF

SAN DIEGO — Despite the advanced American technology on board, the New Zealand challenger for the America's Cup was expected to lose the first two races by 90 minutes under normal sailing conditions last week.

Nevertheless, that technology represents the state of the art for sailing yachts in the 132-foot class. For example, the yacht's crew can take sail-shape readings three times a second with a special video camera that is connected to a Hewlett-Packard Co. Vectra. The HP Vectra in turn is connected to a

Continued on page 72

Inside

- Reviews: Persoft's Ize, PS/2 Model 70-A21, Lotus' Agenda. Page 47.
- Handheld PC compatible from Corvalis. Page 56.
- Mac knows What's Best. Page 67.
- An SAS freebie. Page 72.

Micro Focus COBOL...The Power Behind Successful Software Developers

No software developer wants the expense and hassle of switching compilers. But sometimes there isn't much choice.

Mark Mewhorter, Product Development Manager at Macola, Inc., knows because he's been there. When Macola customers began installing PC-based LANs, Mewhorter's group used another PC COBOL to develop a multi-user version of its integrated Macola Software system. Before long, some major problems began to show up.

"Many of our sites were pushing the limits of our former COBOL in a runtime environment. It just wasn't fast enough," Mewhorter says. "There were also some file corruption problems. We wanted to give our customers guaranteed file recovery under all conditions."

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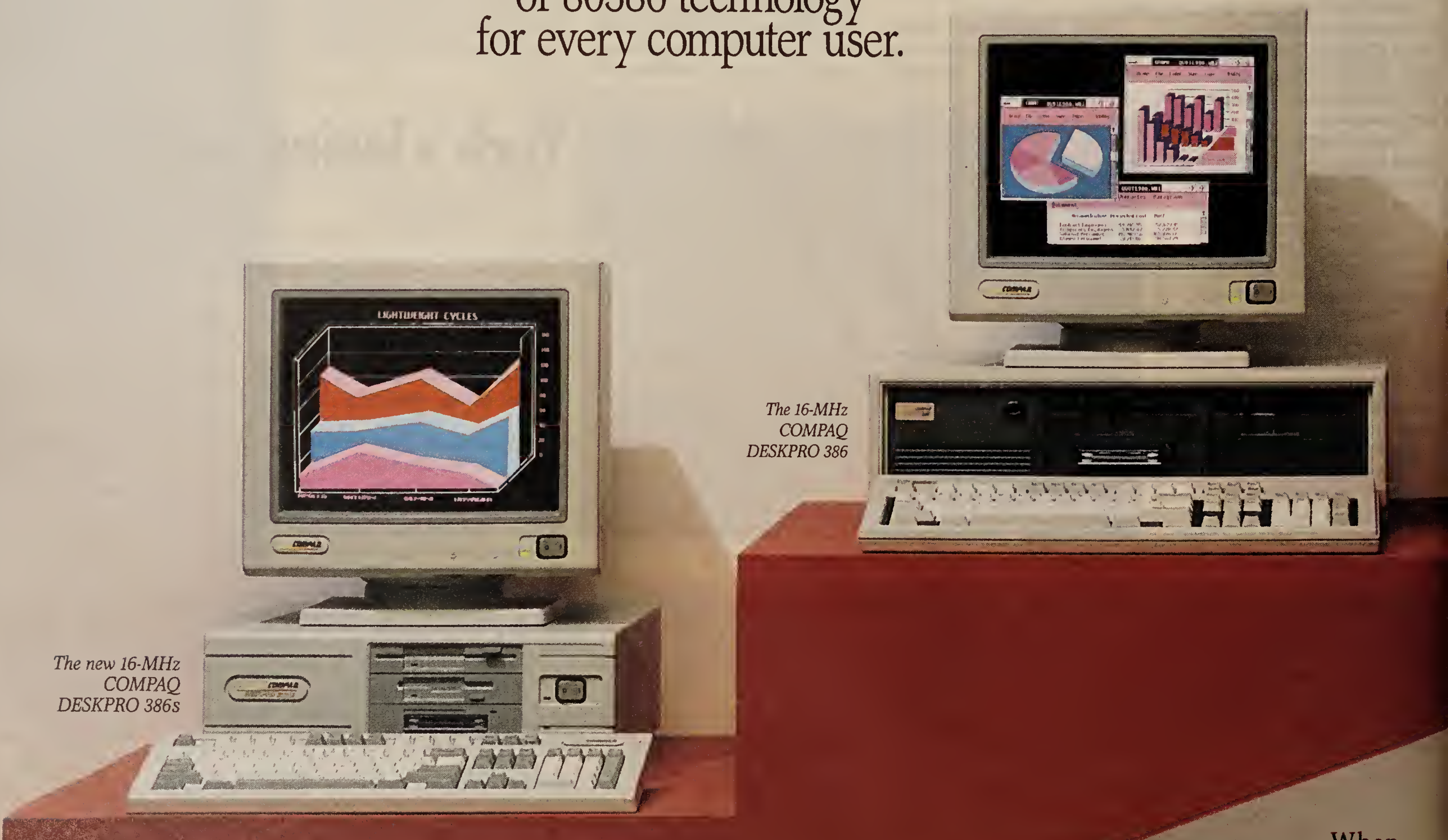

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REVIEWS/NEW PRODUCTS

Ize offers many search options

Ize is a text database package from Persoft, Inc. designed to help information managers discover patterns buried in data.

Features: Ize uses an information presentation format unlike any other text retrieval product on the market. A search in an Ize text-base data file locates documents, called texts, containing indexed keywords. Then it analyzes its search results and presents them in a structured outline form that lists all the other keywords in matching texts.

Selected texts can be displayed at a keystroke and can be linked to other texts. This way, when you retrieve one text, the linked ones can also be retrieved easily, even if they were not part of the keyword search.

Ize indexes keywords assigned by the user. Keywords are added by manually marking them or entering them into a document that was created in Ize. If a document was imported from another program, keywords are automatically assigned to an entire group of records, or a matchup list is created that the program can use to flag keywords as text is imported.

In addition to keyword search, Ize can search for nonkeyword text strings, for dates or ranges of dates or for fuzzy keywords. Using the latter method, the program finds all similar keywords. The program can use Boolean logic combinations of any or all of these types.

Ize manages texts in its own database and tracks documents maintained by other applications through a hot-link feature that interfaces it to external application programs. Ize can hot-link to some 30 programs, including word processors, outliners, spreadsheets, communications packages, a project manager and Microsoft Corp.'s Windows Release 1.0.

Persoft's Ize

Price: $495

- Performance: Very good
- Documentation: Good
- Ease of learning: Satisfactory
- Ease of use: Very good
- Error handling: Good
- Support: Very good
- Value: Good

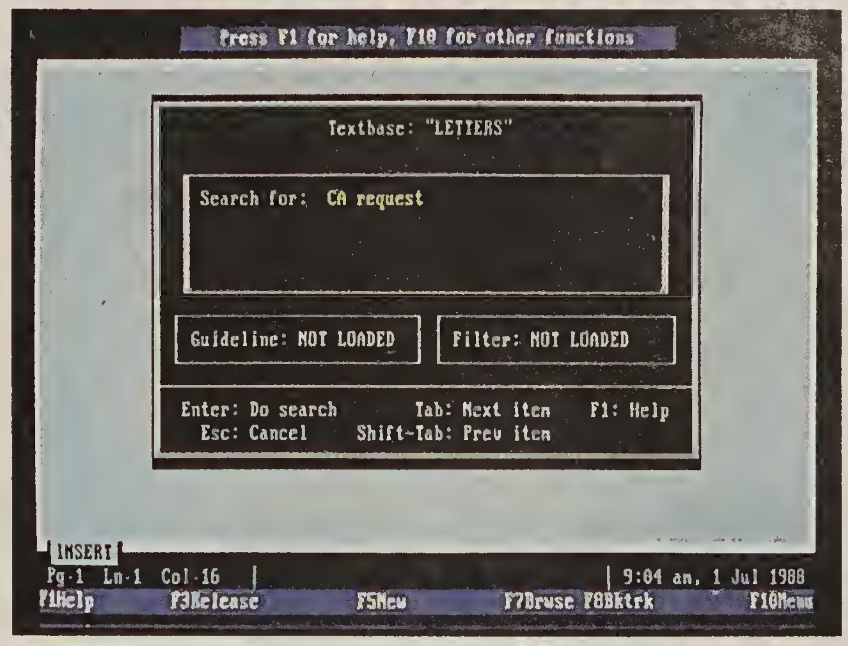
Ize's import function accepts ASCII text files and several popular word processor formats. The export function writes files in ASCII format. A light-duty built-in word processor is included.

Performance: Very good. Where other programs will display information only to the extent to which you know the magic keywords, Ize makes its textbase an open book.

Instead of simply announcing the total number of matching texts found in a search, Ize examines all the keywords in the matching texts and creates an outline that organizes the texts by the frequency with which various keywords show up across documents.

You can retrieve any of the found texts by moving the cursor to that outline entry and pressing Return, or you can retrieve and view a group by issuing the Browse command. The selected text can be edited, copied to a clipboard or exported to a separate file; then you can return to the outline to examine other texts.

If you search on an empty set, you get an outline of the entire text-base, also organized by keyword. There is no wild-card keyword searching; you can do nonindexed searches, and you can mix and match types of searches in one search request.



```
Press F1 for help, F10 for other functions

                Textbase: "LETTERS"

   Search for:  CA request

   Guideline: NOT LOADED    Filter: NOT LOADED

   Enter: Do search       Tab: Next item      F1: Help
    Esc: Cancel     Shift-Tab: Prev item

INSERT
Pg·1  Ln·1  Col·16  |                        | 9:04 am, 1 Jul 1988
F1Help     F3Release      F5New      F7Brwse F8Bktrk        F10Menu
```

Searching *for keywords, fuzzy keywords, nonkeyword text strings*

Although Ize works very well at exploring and retrieving data, it is a major undertaking to set up and manage the data so that the keyword patterns are useful. Ize does not do whole-text indexing: You have to mark or enter keywords for every document.

Fortunately, there is the Keychanger match-up keyword list that can be used in importing documents.

Documentation: Good. The Ize documentation is clear and understandable, with good illustrations. It includes installation procedures, a written tutorial supplemented by disk textbase files, a reference manual and a manual covering printers and hot links. There is no reference to error messages. The on-line Help is quite good in places.

Ease of learning: Satisfactory. Ize is a deep program, and much of the important material is left for users to discover for themselves in the reference manual. The real challenge is

Continued on page 50

Model 70-A21 is small, speedy — but at a price

No sooner had we evaluated the 20-MHz version of IBM's small-footprint Personal System/2 Model 70 than the Model 70-A21, a powerhouse 25-MHz version of the 80386 system, arrived on our doorstep.

The Model 70-A21 boasts many of the same features as the 20-MHz Model 70, but its faster processor and use of Intel Corp.'s cache controller make it a powerful system, ideal for use as a desktop workstation.

The only significant drawback is its suggested retail price. As with the Compaq Computer Corp. Deskpro 386/25, the Model 70-A21 sells for upward of $10,000.

Features: The most notable difference between the Model 70-A21 and Model 70 is the former's use of the Intel 25-MHz 80386 processor, which considerably boosts the system's processing speed. The Model 70-A21 also supports the 25-MHz 80387 math coprocessor.

The product comes with 2M bytes of 80-nsec random-access memory, slightly faster than the 85-nsec memory chips shipped with the 20-MHz Model 70. Memory is expandable to 8M bytes.

Unlike the 16- and 20-MHz versions of the Model 70, the 25-MHz system comes standard with Intel's 82385 cache controller and 64K bytes of cache RAM. Systems equipped with this caching system can access data with no wait states approximately 95% of the time.

Performance: Very good to excellent. The Model 70-A21 is fast. Its blazing processing speed and small-footprint design make it well-suited as a desktop workstation for computer-aided design, desktop publishing, large statistical applications and involved databases.

Personal System/2 Model 70-A21

Price: $11,295

- Performance: Very good to excellent
- Documentation: Very good
- Setup: Very good
- Ease of use: Very good
- Serviceability: Very good
- Support: Poor
- Value: Satisfactory

Because of the system's limited storage capacity, it is less appropriate as a file server on a large network, except, perhaps, in a distributed server environment in which more than one machine is hooked up as a file server.

According to the *Infoworld* Hardware Benchmark System, the Model 70-A21 rates a 6.25 as a CPU. This score is slightly faster than the Compaq Deskpro 386/25, which has a CPU rating of 6.15, and it is faster than the 20-MHz Model 70's CPU rating of 4.19. The CPU speed is excellent.

The 120M-byte enhanced small device interface (ESDI) hard-disk drive shipped with the Model 70-A21 does not fare as well when compared with the Deskpro 386/25. Hard-disk sequential access is very good. Random access is not the fastest recorded, but it earns an excellent score.

The Model 70-A21 also excelled in our Integrated Throughput Test. Times in Autodesk, Inc.'s Autocad, Lotus Development Corp.'s 1-2-3, Word Perfect Corp.'s Word Perfect 5.0 and Ashton-Tate Corp.'s Dbase III Plus were comparable to the Deskpro 386/25.

Software and hardware compatibility and expandability scores are identical to the 20-

Continued on page 50

Agenda takes that extra step

Lotus Development Corp.'s Agenda picks up where other information management products leave off. A hybrid application, Agenda shares features with outliners, database programs, word processors, spreadsheets and even programming languages.

Features: Agenda consists of four fundamental elements: items, categories, notes and views. Items are free-form text strings that contain up to 350 characters and can consist of almost anything, including projects, tasks, phone calls and appointments.

Each item can be assigned to one or more categories. Predefined categories include date-related categories such as "When Date" and "Entry Date."

Users can also define their own categories. These can be structured hierarchically and then referenced by name or by their "parent" or "ancestor." Parent categories inherit items of their children.

Lotus' Agenda

Price: $395

- Performance: Very good
- Documentation: Excellent
- Ease of learning: Satisfactory
- Ease of use: Very good
- Error handling: Very good
- Support: Very good
- Value: Excellent

Any item or category can have a note attached to it, up to 10K in length. Notes can either reside in the database or be external files. Users can also cut and paste between notes and items.

Agenda can automatically assign an item to categories based on the item's contents. You can even provide multiple names for a category entry.

You can also define assignment conditions based on assignment — or nonassignment — to

Continued on page 52

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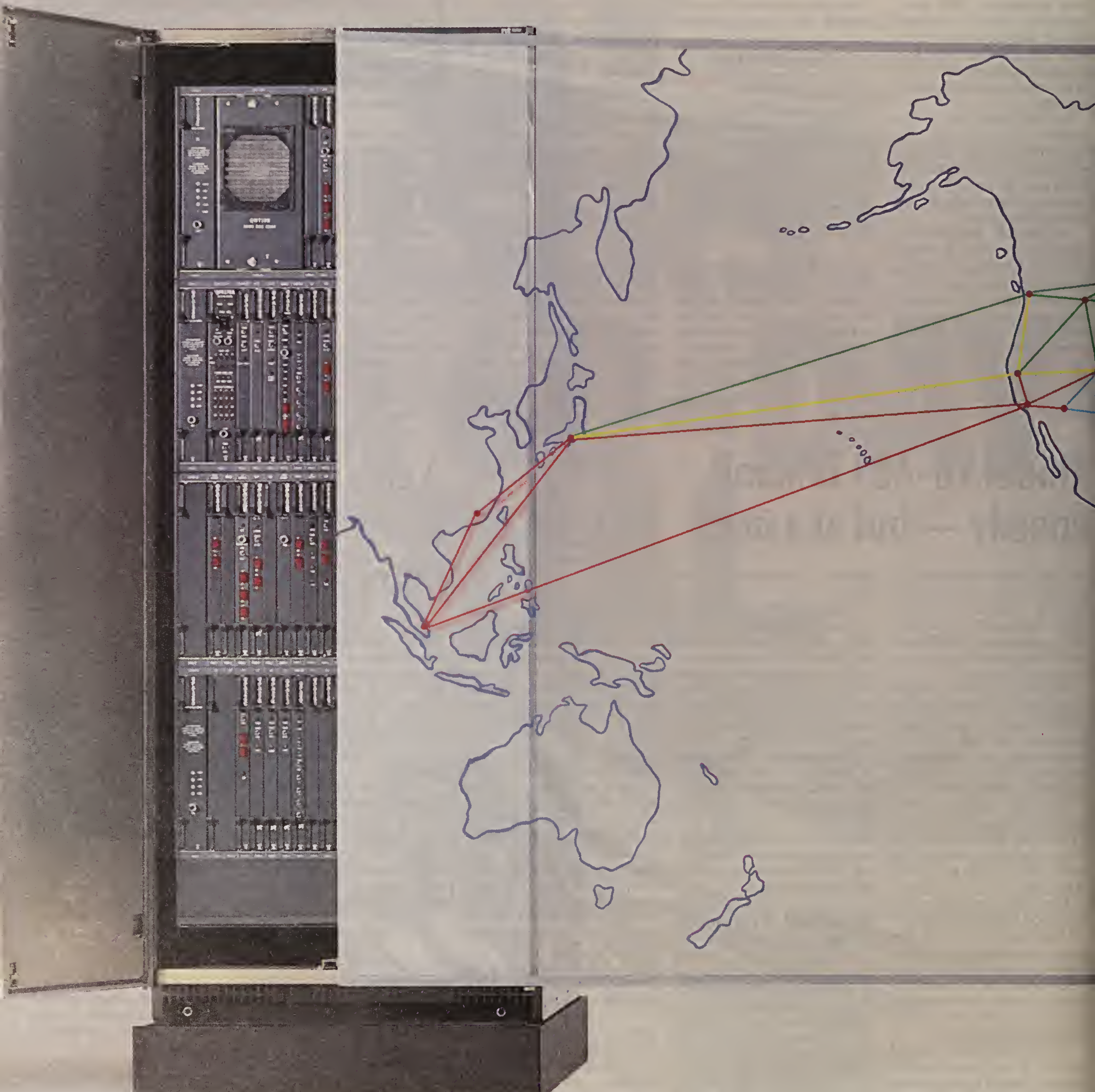

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NETWORKING

Model 70

FROM PAGE 47

MHz Model 70-121. The Model 70-A21 gets a design merit bonus for using the Intel 82385 cache controller.

Documentation: Very good. Documentation shipped with the Model 70-A21 is identical to that accompanying the 20-MHz version. The user guide is concise and informative. It includes a table of contents and an index. Setup is discussed in a foldout sheet.

Setup: Very good. Like most PS/2 systems, setup of the Model 70-A21 is trouble-free.

Ease of use: Very good. Users can now bypass the floppy drive when booting, providing added security. This can be beneficial when using the computer in multiuser systems and as a server on a network.

> LIKE MOST PS/2s, setup of the Model 70-A21 is trouble-free.

Serviceability: Very good. The Model 70-A21's motherboard is composed primarily of surface-mount components. This increases reliability while reducing the board size. The Model 70 features innovative design and solid construction. Unlike the 20-MHz system, the 25-MHz model underwent a few last-minute additions. These should not affect performance.

Support: Poor. IBM offers only a standard one-year warranty and dealer-only technical support. The quality of service varies according to the dealer.

Value: Satisfactory. Speed and convenience are not cheap. The Model 70-A21 costs $11,295. This price includes 2M bytes of RAM and a 120M-byte ESDI hard drive but no monitor.

Microsoft Corp.'s MS-DOS and OS/2 must be purchased separately. For $595 you can get IBM's 8512 Video Graphics Array color monitor.

Due to its limited mass storage capacity, the Model 70-A21 is not suited as a file server on a large network. It really shines as a desktop workstation: Its small-footprint design and fast computing speed are perfectly suited for use as a desktop workstation.

Ize

FROM PAGE 47

keywording the text in a way that will produce keyword outlines that are useful. This is harder than it seems. It will take weeks before the Ize user gets more out of Ize than the labor put in.

Ease of use: Very good. Ize offers a well-designed user interface as well as a variety of ways to view, acquire and link data to other files. Also, there are no frustrating holes in the program's logic.

Error handling: Good. There is always a warning message display and "Y/N" prompt whenever a file is to be changed or deleted. The user can lock Ize text-base texts to prevent accidental changes or deletes. A backup version of text is saved whenever modified text is saved.

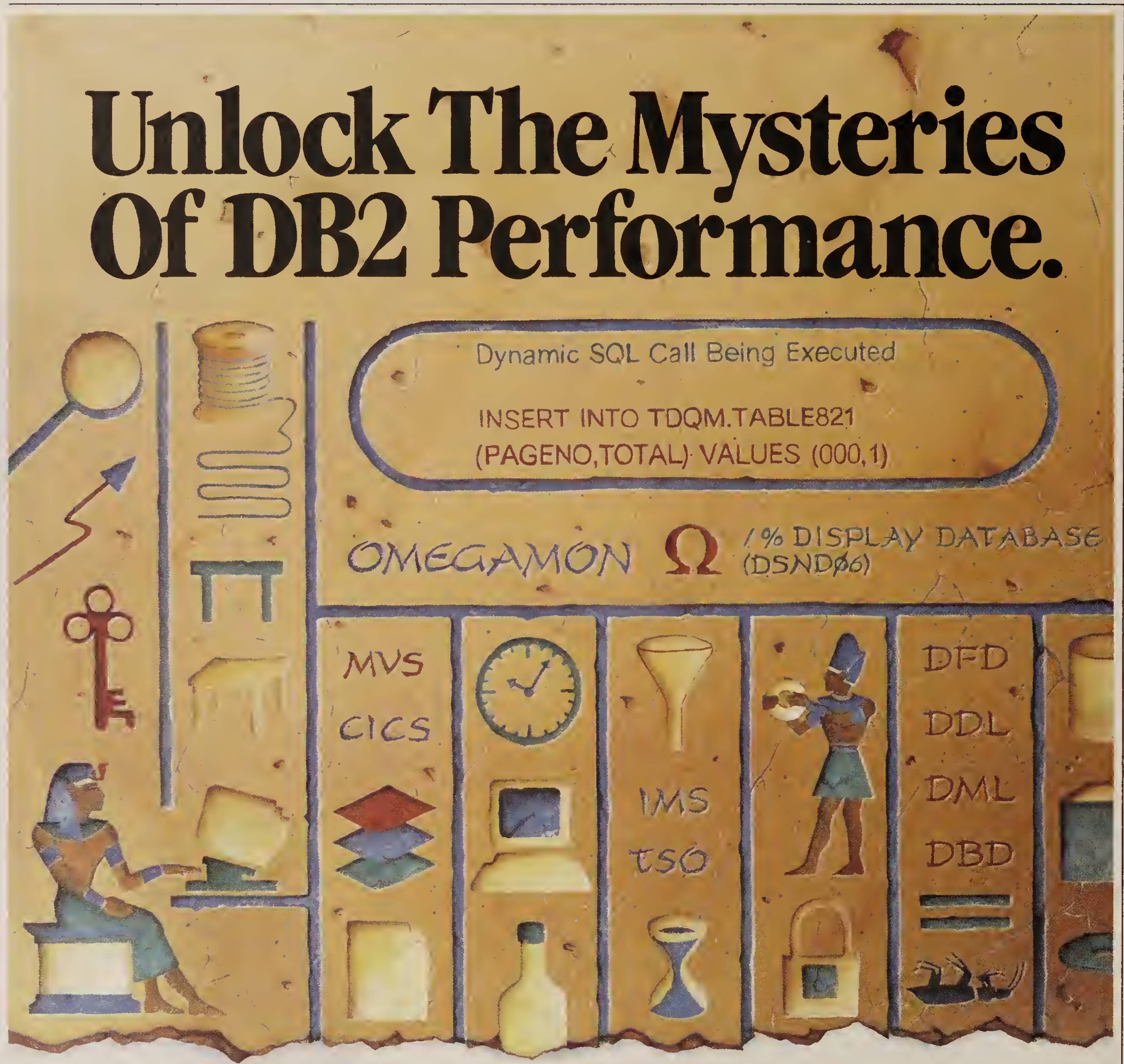
The most recently purged file may be recovered. Earlier purged texts that have not yet been overwritten can be recovered using the Regenerate command.

Support: Very good. Ize comes with a 45-day money-back guarantee. Upgrades are free for the first 60 days. Persoft has unlimited free — but not toll-free — telephone support.

Our three Help calls were answered promptly. The technical staffers were polite and helpful, and they answered questions knowledgeably.

Value: Good. The price you pay for the capability to look at your data as a whole and see the structure implicit in the keywords is not the $495 list price but the ramp-up time you'll spend keywording your texts and building up and refining a Keychanger keyword list.

But if you are on a continual quest for the serendipity of connecting data and your biggest fear is that by narrowing your Boolean search you're losing something that might be important, then Ize of


Unlock The Mysteries Of DB2 Performance.
Dynamic SQL Call Being Executed
INSERT INTO TDQM.TABLE821 (PAGENO,TOTAL) VALUES (000,1)
OMEGAMON Ω
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Agenda

CONTINUED FROM PAGE 47

other categories and to various date conditions.

A view is an arrangement of a selected item by one or more categories. If you want items cross-referenced by additional categories, you can add category columns to the view. You can define as many views as needed and instantly switch among them.

Agenda also includes a macro function and a modest macro command language.

Performance: Very good. Agenda is a large program that requires a good portion of free memory. To address this limitation, the system comes with the kernel program derived from Metro, Lotus' TSR utility program, and two resident applications that run under Metro.

Item, which is the first resident utility, stores 10 items in memory to load later into Agenda. Clipboard takes information from the screen and later pastes it into Agenda.

Agenda can work with databases up to 4M bytes in size. Things do, of course, slow down when the database gets large.

Assignments are updated immediately upon entering an item, but if you make changes to categories or assignment conditions, you'll have to perform Agenda's equivalent of a spreadsheet recalculation.

There are two stand-alone file conversion programs that translate Metro's List Manager files or text files into a structured format that can be imported into Agenda. We were able to read in a lengthy file of notes, importing each paragraph as an item. Paragraphs that exceed the 350-character item limit are intelligently spilled over into a note.

You can import data from traditional database applications, E-mail messages and even spreadsheets saved as text files. But if you want to import categories as well as items, you will have to spend some time developing definition files.

Agenda provides flexible database printing. A full-screen panel lets you control details such as headers and footers, margins and setup strings.

Documentation: Excellent. Both the written material and on-line Help are superb. The user guide is filled with examples and is well-organized and indexed. Additional materials include a tutorial book, a booklet describing the sample applications and a guide to developing definition files for use with the text file translator.

Ease of learning: Satisfactory. Lotus has done nearly everything possible to facilitate the learning of this product. But the reality is that it is complex. Beginners should go through the tutorial keystroke by keystroke. Experienced PC users will have no trouble getting started, but mastering all the intricacies and advanced features will take a significant time commitment and some experimentation.

Ease of use: Very good. The horizontal moving-bar menu system is augmented by mnemonic accelerator keys and function keys. If the built-in commands are not enough, you can define your own with the macro function.

Once you learn the essentials, Agenda is a joy to use. However, even experienced users might be puzzled on occasion when the program does something unexpected.

Error handling: Very good. Agenda reads only part of your database into memory at any time. Some changes are written to disk immediately, but others are not updated until you exit the program. In the event of a power failure, the open database will likely be damaged.

There is a file backup command that updates the disk file on demand or upon exiting. You can also activate an automatic-save interval. For some reason, this feature comes disabled. There is an extensive Undo feature for erased items.

Agenda passed our crash test with flying colors; we could not get the product to misbehave or lock up the system.

Support: Very good. Lotus provides unlimited telephone support from 8:30 a.m. to 8 p.m. Eastern Standard Time, but the number is not toll free. Telephone support is also available in Canada and the UK. A premium support service is available for $75 per year.

Although both calls we made to the technical support group met with a few busy signals, once we got through they were handled with a minimal amount of time on hold.

Value: Excellent. Clearly, not everyone needs this level of information management. If you're looking for a simple scheduling or organizational aid and do not want to invest much time in it, try an outliner instead. But if you deal with a lot of complex information that can be viewed from several different perspectives, you owe it to yourself to spend $395 and give Agenda a try.

> ONCE YOU LEARN the essentials, Agenda is a joy to use. However, even experienced users might be puzzled on occasion when the program does something unexpected.

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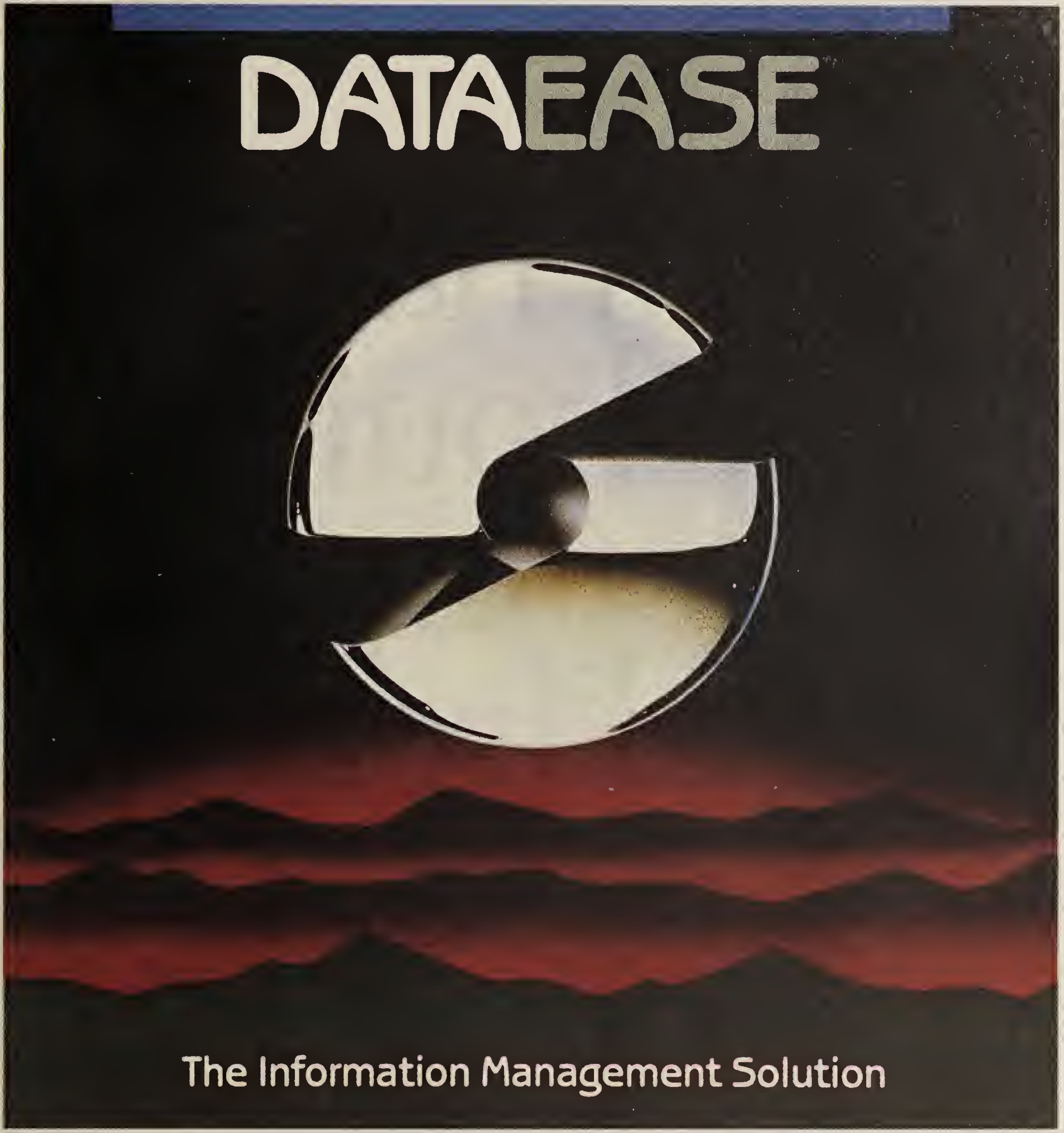

Surprised?

You may be, but others aren't. Discriminating application developers. IC managers. MIS professionals. VARs. End users. Anyone who's experienced a DataEase® seminar. Or seen DataEase in action. Even International Data Corporation wouldn't be surprised. Their study, published in June 1988, showed that in 1987, DataEase shipped more units than any other PC relational database management system in the world. Except one.

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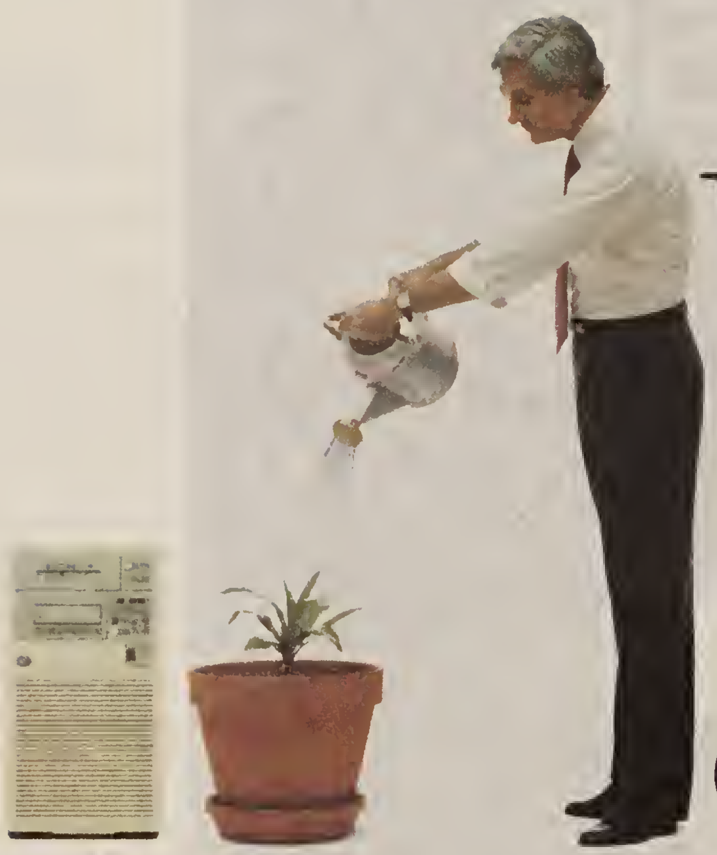

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NEW PRODUCTS

Systems

A handheld system that is IBM Personal Computer-compatible has been introduced by **Corvallis Microtechnology, Inc.**

Designated the **MC-II**, the system is said to be programmable and compatible with four languages: Mbase, which is compatible with Ashton-Tate Corp.'s Dbase III Plus; MC-Basic, which is compatible with GW-Basic; C, which is compatible with Microsoft Corp.'s C language; and 41M, which is compatible with Hewlett-Packard Co.'s HP-41CX.

The device also includes two RS-232 communications ports and supports the Kermit file transfer protocol.

MC-II costs $750.

Corvallis, 895 N.W. Grant Ave., Corvallis, Ore. 97330. 503-752-5456.

Brother International Corp. has introduced a personal word processor designed to provide spreadsheets, correspondence formats and resume formats.

Designated the **WP-650**, the system's 3½-in. spreadsheet disk reportedly adds a 65-row by 20-col spreadsheet to advanced text-editing features.

The product incorporates several arithmetic operations, such as exponents, percentage and decimal calculations. Additional functions include name, address and telephone number listings.

WP-650 costs $999.

The company has also announced the **WP-4U**, an 11½-pound word processor that is targeted at professional writers, home office workers and students. A built-in tutorial is included, and the system is shipped with 114K bytes of internal memory, the vendor said.

It also comes with a 16K-byte card option to allow for memory expansion. Standard functions include search and replace; block, move, copy and delete; mail merge; and centering and justification.

WP-4U is priced at $799.

Brother International, 8 Corporate Place, Piscataway, N.J. 08855. 201-981-0300.

Theos Software Corp. has announced the availability of **RM/Cobol 74 Version 2.1** for use with its Theos 286-V multiuser, multitasking operating system.

RM/Cobol is a full implementation of the ANSI 1974 standard for Cobol compilers, the vendor said. Theos 286-V supports up to 32 users on Compaq Computer Corp.'s 386 machines, as well as IBM's Personal Computer AT and compatibles. The operating system provides multitasking capabilities for real-time processing applications.

RM/Cobol for Theos 286-V costs $1,250 for the development kit, $250 for runtime systems.

Theos Software, Suite 360, 1777 Botelho Drive, Walnut Creek, Calif. 94596. 415-935-1118.

Software applications packages

Office Solutions, Inc. has announced **Officewriter 6.0**, an enhanced version of its flagship product line.

Forty different capabilities have reportedly been added, including graphics page preview and a forms-creation and list-processing program.

The latest release also includes Officelink, a module providing connection capabilities to Ashton-Tate Corp.'s Multimate, Micropro International Corp.'s Wordstar, IBM's Document Content Architecture and ASCII. User guides, keyboard templates and a reference guide are also included.

Officewriter 6.0 is priced at $495; upgrades reportedly cost $75.

Office Solutions, 2802 Coho St., Madison, Wis. 53713. 800-228-0747.

A personal computer-based forecasting and time series analysis package has been introduced by **SPSS, Inc.**

SPSS Trends II is a stand-alone package that includes mod-

eling techniques ranging from curve fitting to Box-Jenkins methods and spectral analysis. Also included are translation facilities, which enable users to read and write files for Lotus Development Corp.'s 1-2-3, Lotus' Symphony and Ashton-Tate Corp.'s Dbase products. The package runs on IBM Personal Computer XTs and ATs, Personal System/2s and compatible systems and requires 640K bytes of random-access memory and a hard disk. IBM's PC-DOS or Microsoft Corp.'s MS-DOS 2.0 or higher is also required.

SPSS Trends II costs $695.

SPSS, 444 N. Michigan Ave., Chicago, Ill. 60611. 312-329-2400.

A spelling checker designed to work with optical character recognition (OCR) systems has been released by **Trigram Systems**.

The vendor claims that **OCR Microspell** can check up to 18,000 word/min while correcting errors in text that are read by OCR systems and page scanners. OCR Microspell runs on all IBM Personal Computers and compatible systems with a minimum of 128K bytes of random-access memory. The software is not copy protected.

OCR Microspell costs $69.95.

Trigram Systems, 5840 Northumberland St., Pittsburgh, Pa. 15217. 412-422-8976.

A software package that reportedly enables users to automatically produce books, booklets and flyers has been introduced by **Beaman Porter, Inc.**

The **Powertext Bookmaker** runs on Intel Corp. 80286 and 80386-based machines and automatically typesets books at a rate up to 20 page/min, the vendor said. Other features include automatic page layout, hyphenation and justification, page breaking and table of contents and indexing capabilities. The package also runs on any IBM Personal Computer or compatible system with a minimum of 512K bytes of memory. IBM Enhanced Graphics Adapter cards are not required.

The Powertext Bookmaker costs $395.

Beaman Porter, 417 Halstead Ave., Harrison, N.Y. 10528. 800-431-0007.

Software utilities

HDC Computer Corp. has announced a desktop configuration system for managing the Microsoft Corp. Windows environment.

Called **Windows Manager**, the package incorporates features that can be accessed from any window using the standard window control menu, according to the vendor.

Users can reportedly customize the opening Windows screen with a preferred design, color or corporate logo. The user can also determine a period of inactivity after which the screen is automatically blanked out.

Windows Manager is reportedly available now and will cost $79.95.

HDC, 15379 90th St. N.E., Redmond, Wash. 98052. 206-885-5550.

Solution Systems has released **Version 2.1** of **Brief**, a programmer's editor package for creating and editing software.

The latest update allows programmers to compile from within the editor using any compiler regardless of the memory requirement, the vendor said. Other features include pop-up menus and bookmarks to allow tagging of as many as 10 different spots within files. Several macro language primitives have also been added to the product's macro language.

Brief 2.1 is available to registered users of Brief 2.0 Plus for $35.

Solution Systems, Suite 410, 541 Main St., S. Weymouth, Mass. 02190. 800-821-2492.

A documentation compiler that reportedly allows programmers to automate the creation and maintenance of source-code documentation has been introduced by **Polytron Corp.**

The product, **Polydoc**, is said to automatically assemble documentation directly from source code or other text files. A current and complete source-code

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documentation report can be printed at any time for the entire project or for selected modules. An IBM Personal Computer, PC XT or AT or compatible system running Microsoft Corp.'s MS-DOS 2.0 or higher is required. In stand-alone or memory-resident mode, Polydoc uses 90K bytes of random-access memory.

Polydoc costs $199, and a five-user license is available for $597.

Polytron, 1700 167th Place N.W., Beaverton, Ore. 97006. 800-547-4000.

Macintosh products

Abacus Concepts, Inc. has extended its line of statistical analysis software for the Apple Computer, Inc. Macintosh machine.

Statview SE+Graphics was designed specifically for the Macintosh SE and Macintosh Plus. Features include Macdraw tools, user-definable axes, a mini text editor and a variety of graphs that can be printed with any output device that has a Macintosh driver. The package performs complete descriptive statistics, polynomial and stepwise regression, exploratory factor analysis and other mathematical functions.

Statview SE+Graphics costs $399.95.

Abacus Concepts, 1984 Bonita Ave., Berkeley, Calif. 94704. 415-540-1949.

Quark, Inc. has released **Version 2.0** of **Quarkexpress,** its desktop publishing program designed to run on Apple Computer, Inc. Macintosh systems.

According to the vendor, additional features include style sheets, streamlined cut, copy and paste operations, faster printing speeds and precise on-screen color shading. The program also supports multiple file formats for export to other programs.

Quarkexpress 2.0 costs $795. Free upgrades are available for Quark users who purchased the package this year and for extended warranty customers from June 30, 1987. Others can upgrade for $125.

Quark, Suite 100, 300 S. Jackson, Denver, Colo. 80209. 303-934-2211.

A software product that is said to offer 65 commonly used generic business forms for display on a microcomputer screen has now been made available from **Softview, Inc.**

Called **Softview Formset, Business Forms Edition,** the product runs on Apple Computer, Inc.'s Apple IIGS and Macintosh systems as well as IBM Personal Computers. The forms allow the user to enter data directly into appropriate fields while values are automatically calculated in the background. A customization worksheet within the package allows users to customize each form with the company's name, logo, address and other recurring information.

Softview Formset, Business Forms Edition costs $95.

Softview, 4820 Adhor Lane, Suite F, Camarillo, Calif. 93010. 800-622-6829.

Development tools

A personal computer-based expert system builder aimed at people who do not have artificial intelligence technology skills has been introduced by **Intelligent Environments, Inc.**

The rule-based package, called **Crystal,** reportedly allows users to develop applications easily and quickly. The product is targeted at MIS departments, information centers and other PC system-building environments. It is written in C, and no specialized hardware or software is required.

Crystal costs $995 for the DOS version and $1,995 for the OS/2 version. Quantity discounts and site licenses are also available.

Intelligent Environments, P.O. Box 388, Chelmsford, Mass. 01824. 617-256-6412.

A database design tool developed for Apple Computer, Inc's Macintosh computer is now available from **Andyne Computing Ltd.**

Called **Ervision 2.0,** the product reportedly utilizes the graphics capabilities of the Macintosh to design and maintain databases, including SQL-based systems running on mainframes, minicomputers and microcomputers. The product provides built-in design rules to ensure consistency and completeness of design.

A design report that contains diagramatic and textual information can be sent to the printer or, alternatively, to a disk file for manipulation by other Macintosh tools.

Ervision 2.0 costs $495.

Andyne Computing, Suite 202, 544 Princess St., Kingston, Ont., Canada. K7L 1C7. 613-548-4355.

Training

Fliptrack Learning Systems has introduced a self-study audio cassette course for running Aldus Corp.'s Pagemaker 3.0 on Apple Computer, Inc.'s Macintosh.

The course, called **How to Use Pagemaker, the Macintosh Version,** consists of five cassette lessons of an hour or two each and was developed to enable the new user to learn in a hands-on, interactive mode. A data disk with teaching files and a fully indexed reference guide are also included.

How to Use Pagemaker, the Macintosh Version costs $195.

Fliptrack Learning Systems, Suite 200, 999 Main St., Glen Ellyn, Ill. 60137. 312-790-1117.

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Easy decision.

After all, 1-2-3 Release 2.01 has recently been rated the top-performing spreadsheet for an unprecedented fifth straight year by the NSTL.[2] In fact, 1-2-3 is the backbone of business, with over 7 million users who depend on it everyday.

Plus, the upcoming 1-2-3 Release 3[3] will be the most powerful spreadsheet on the market by far, yet it will offer the familiar 1-2-3 interface and be fully compatible with all your present 1-2-3 data, macros and applications.

The new 1-2-3 will offer an exciting 3-dimensional spreadsheet for better organization and consolidation of data. Plus, improved graphics and powerful database enhancements, including the ability to access external databases, like dBase®, from within your spreadsheet.

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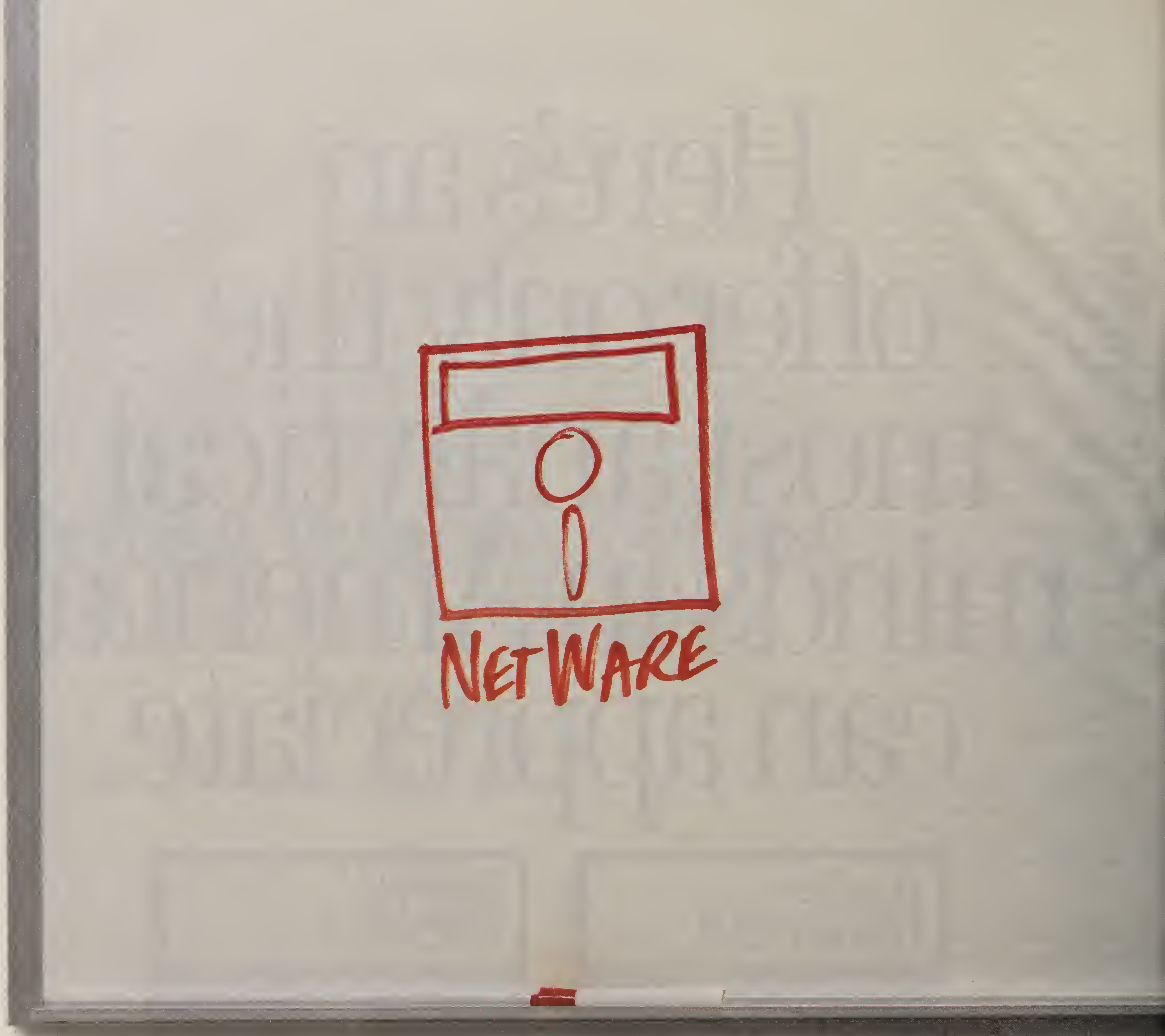
Lotus 1-2-3

(1) Upgrade offer valid September 6, 1988 through 30 days after the 1-2-3 Release 3 ship date. (2) National Software Testing Laboratories, Inc. Software Digest Ratings Report, June, 1988.
(3) 1-2-3 system requirements will vary from Release 2.01 to Release 3. 1-2-3 Release 3 runs under DOS and OS/2; Hard disk and 640K required. Lotus certified compatible PC with 80286 processor or better recommended.
Lotus and 1-2-3 are registered trademarks of Lotus Development Corp. dBase is a registered trademark of Ashton-Tate Corporation.



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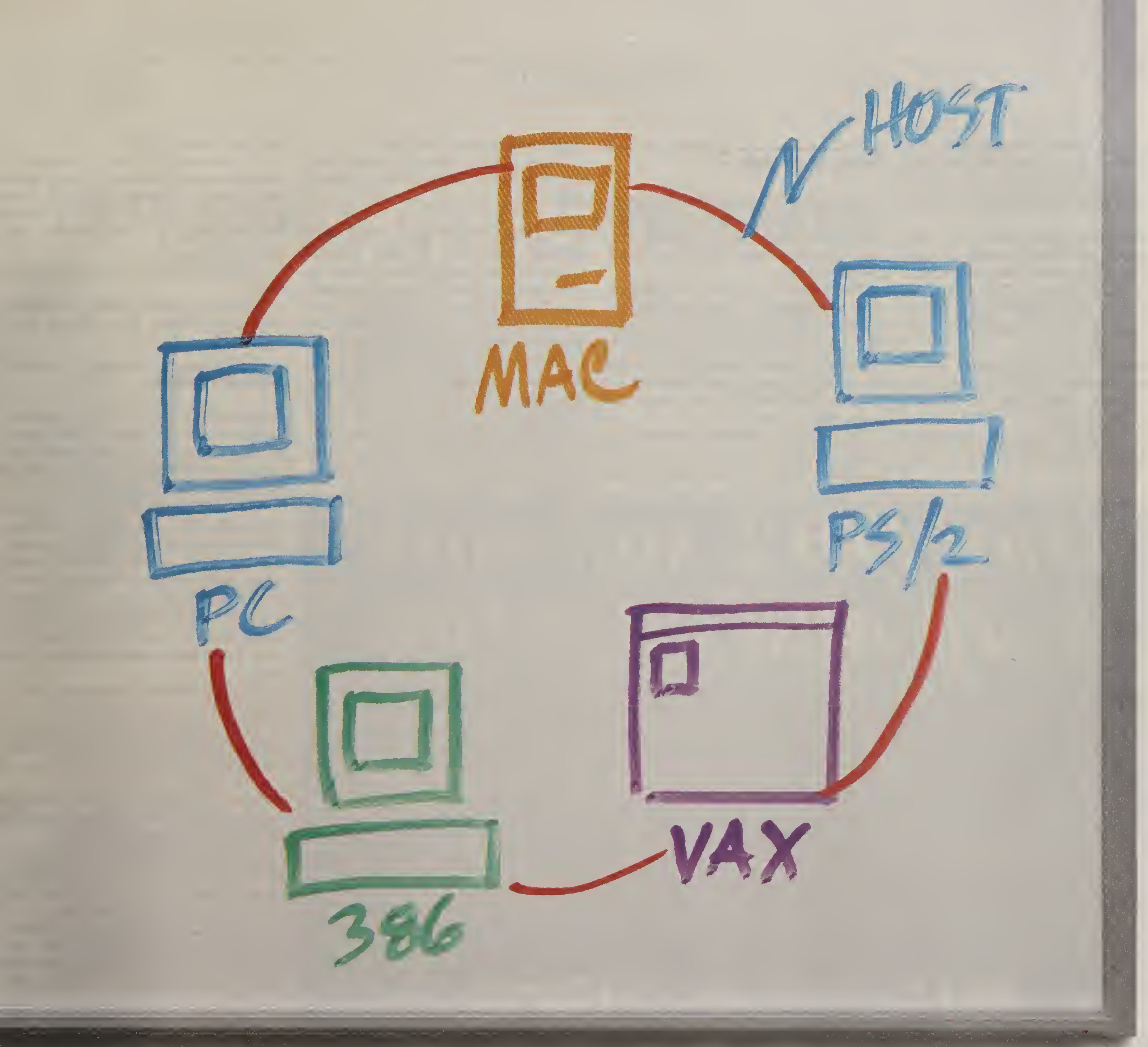

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1st-Class Expert Systems, Inc., formerly known as Programs in Motion, Inc., is now making available an expert training system for would-be expert system developers.

The training system consists of a two-disk tutorial and demonstration package designed to help a user learn by example and hands-on practice. The **1st-Class Fusion Expert System Tutorial** package costs $20 and is available directly from the vendor.

The 1st-Class Expert System Development software costs $495; the 1st-Class Fusion Professional Developer's Edition costs $1,295.

1st-Class Expert Systems, 286 Boston Post Road, Wayland, Mass. 01778. 508-358-7722.

Data storage

Taxan U.S.A. Corp. is offering a product that is said to enable data migration from 5¼-in. floppy disks to the IBM Personal System/2 Models 50, 60 and 80 microcomputers.

The **TDM 5+** unit has a small footprint and operates in a plug-and-play capacity. It does not require a slot on the IBM Micro Channel bus. The TDM 5+ reportedly offers transparent operation for all DOS commands and transfers data to either the computer hard disk or the floppy disk.

The product is available in 360K- and 720K-byte versions as well as 1.2M-byte capacities. TDM 5+ costs $395 and includes cable, adapter and drive.

Taxan U.S.A., 18005 Cortney Court, City of Industry, Calif. 91748. 818-810-1291.

A 1.2G-byte write-once read-many (WORM) subsystem for IBM Personal Computers and compatible systems has been announced by **N/Hance Systems, Inc.** The **N/Hance 5120 WORM** optical disk system reportedly offers 1.2G bytes of storage on a double-sided 5¼-in. removable cartridge. It includes proprietary document management and retrieval software and has a data transfer rate of 6.5M bit/sec.

The 5120 WORM subsystem costs $6,188 and includes drive, controller, installation software, document management software and cables.

The company has also introduced a two-drive external version of the subsystem called **N/Hance 5120/2**. The product provides 2.4G bytes of optical WORM storage in a single cabinet and costs $9,688.

Both products are available immediately.

N/Hance Systems, 908R Providence Highway, Dedham, Mass. 02026. 617-461-1970.

Peripherals

Hewlett-Packard Co. has announced an interface kit that allows the HP Scanjet desktop scanner to support Apple Computer, Inc.'s Macintosh Plus, Macintosh SE and Macintosh II computers.

The **HP 88390B** interface kit includes the HP Desk Gallery software, which is a scanning and painting package. The software consists of two components: HP Deskscan scanning software, which reportedly scans at resolutions from 38 to 600 dot/in.; and Deskpaint, which allows the user to revise, polish or turn the image, erase portions or add text.

The HP 88390B has a price tag of $495.

HP, Customer Information Center, 19310 Pruneridge Ave., Cupertino, Calif. 95014. 415-857-1501.

A touch screen that plugs directly into a serial mouse port has been announced by **Information Strategies, Inc.**

Called **Mousetouch**, the product is said to emulate all mouse functions, including single clicks, double clicks and drag-and-move-cursor operations.

The touch-screen system uses Elographics, Inc.'s Acctouch screens, which reportedly provide a 4,096- by 4,096-pixel resolution. Mousetouch is compatible with Apple Computer, Inc.'s Macintosh II; IBM's Personal Computer, XT and AT; and Intel Corp. 80386 machines.

Mousetouch costs $470 in OEM quantities.

Information Strategies, 888 Greenville Ave., Richardson, Texas 75081. 214-234-0176.

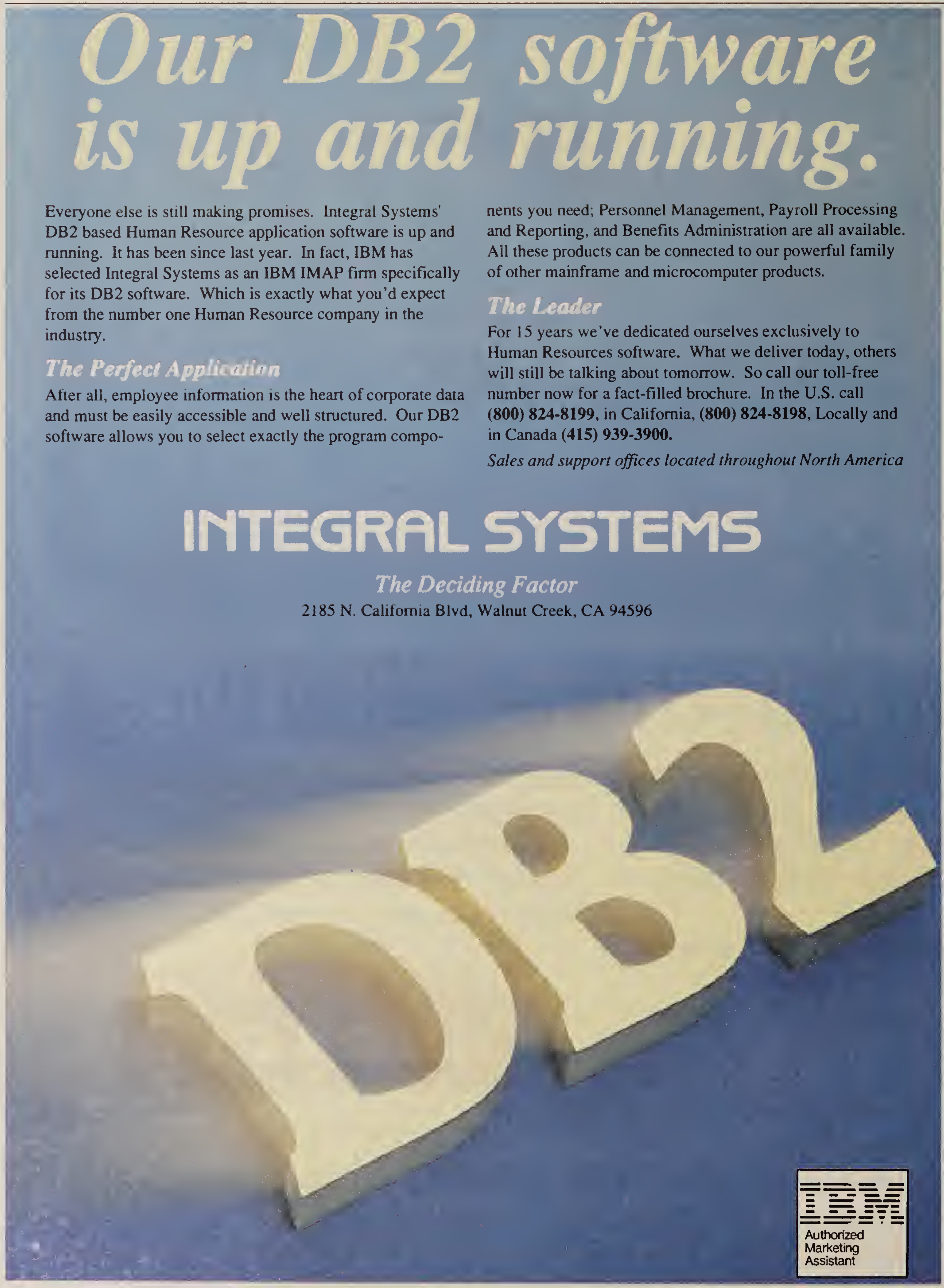
Board-level devices

Memtech Technology Corp., a U.S. manufacturer of bubble-memory devices, has introduced two products: **The Standard Bubble Module** (SBM); and the **SBX-261**, an add-on read-and-write memory for microcomputers. Bubble-memory technology consists of a series of small domains, or "bubbles," of magnetization in a thin epitaxial film on garnet chips. It is resistant to radiation and is primarily used in military applications.

The SBM's modular structure allows multiple units to be vertically stacked onto a motherboard. The product is compatible with IBM printed-circuit cards, Intel Corp. Multibus I and II boards, standard bus boards and other technologies. The SBM includes 512K bytes of memory and costs $600 for the standard module.

Designed for Multibus user support, the SBX-261 offers nonvolatile storage for single-board computer systems. The unit requires only 5V from the interface bus, thereby eliminating the need for a 12V line. The SBX-261 costs $900 for 100 pieces.

Memtech Technology, 101 Blue Ravine Road, Folsom, Calif. 95630. 916-351-3100.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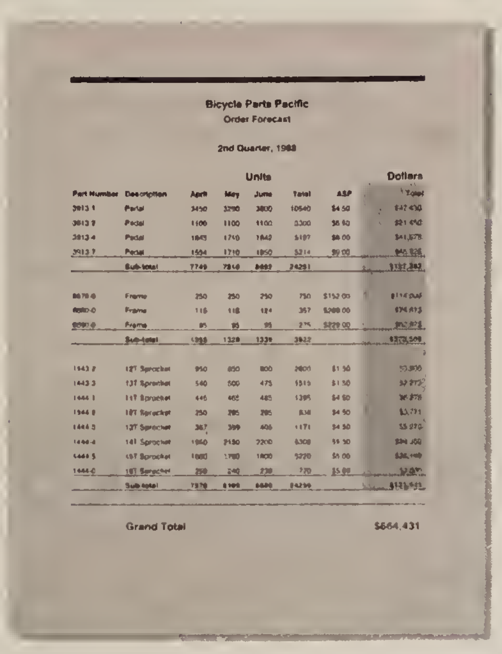

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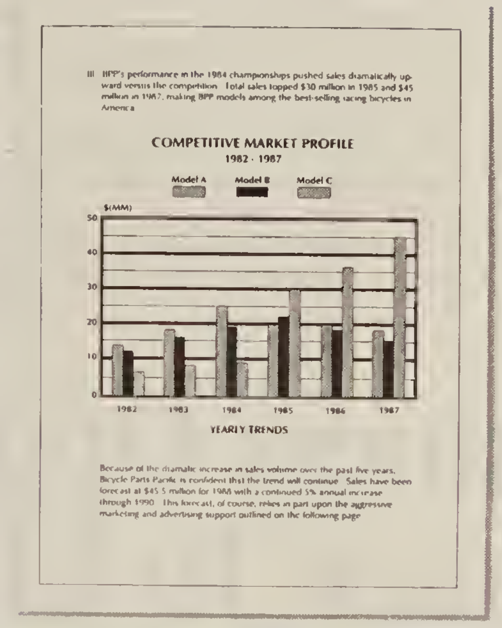

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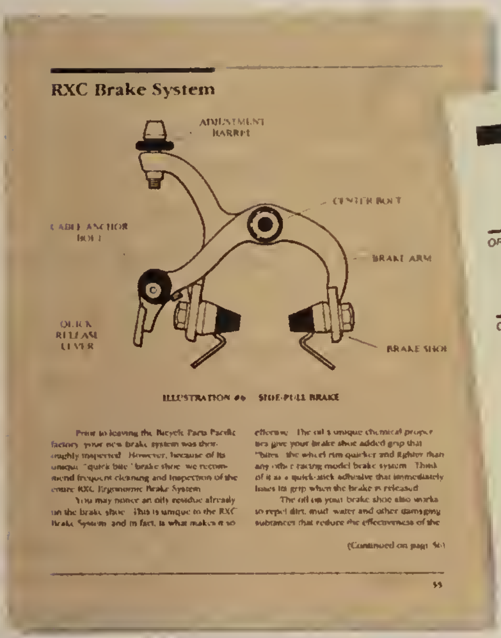
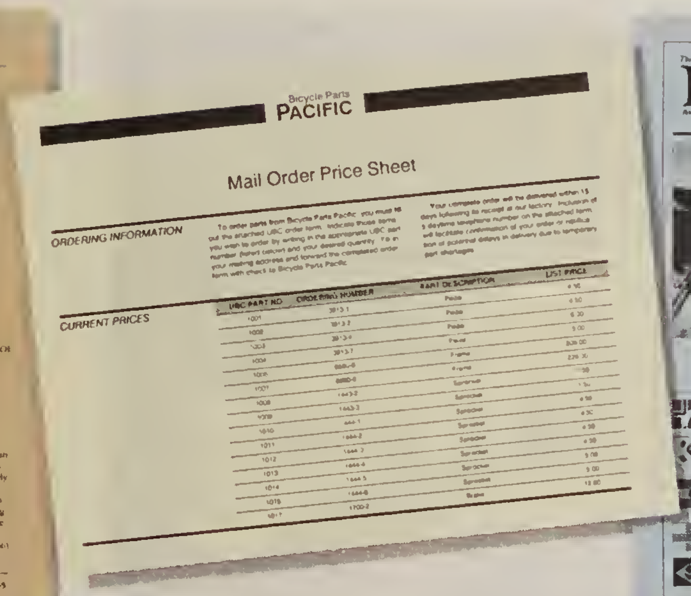


RXC Brake System



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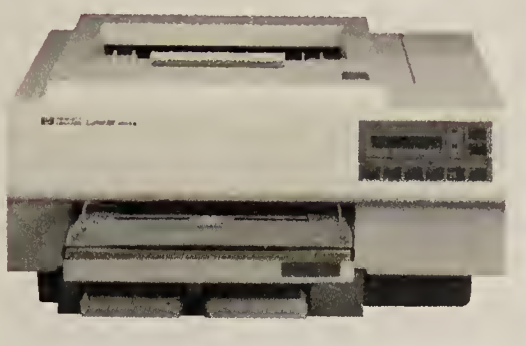

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Speak English to your Mac

BY MICHAEL ALEXANDER
CW STAFF

BERKELEY, Calif. — Users of Apple Computer, Inc.'s Macintosh II can now use conversational English to access SQL databases on Macintoshes and Digital Equipment Corp. VAX computers, according to spokesmen for Natural Language, Inc.

The company recently introduced NLI Datatalker, an English language interface to relational database management systems, and NLI Connector, a knowledge-based tool used to familiarize Datatalker with specific database applications.

The two products enable Macintosh users to access database management systems running on Macintosh and VAX computers via a network without requiring them to learn SQL, said Tania Amochaev, NLI's president and chief executive officer.

Among the benefits of using Datatalker are reduced training costs, flexible access to data and increased productivity, she said.

NLI Datatalker understands free-form English sentences with a vocabulary of 10,000 words and 1,100 concepts, the company said. The product supports all major commercial relational database management systems, including Oracle from Oracle Corp., Sybase from Sybase, Inc., Ingres from Relational Technology, Inc., RDB from DEC and Informix from Informix Software, Inc., Amochaev said.

NLI Connector is an interactive tool designed to teach Datatalker relationships and attributes used in a specific database application.

Both products are available for the Macintosh II running under A/UX, Apple's proprietary version of Unix. They require 6M bytes of random-access memory, a 60M-byte hard disk drive and A/UX Version 1.1.

Datatalker is priced at $5,000, and the Connector is priced at $10,000. Volume discounts are available, the spokesmen said.

R:Base users offered bilevel support plan

BY ALAN J. RYAN
CW STAFF

REDMOND, Wash. — With corporate America putting ever increasing value on information, innovative vendors are finding ways to cash in on corporate fears that time and information could be lost because of a simple software problem.

Microrim, Inc., for example, recently announced a Corporate Services Program (CSP) for customers of its R:Base database family.

The support consists of two tiers but can be altered to the customer's specifications, the company said.

Standard CSP, which costs $4,000, offers on-line, remote diagnostic support to subscribers, enabling support technicians to view users' screens and walk customers through their problems.

STANDARD CSP offers on-line, remote diagnostic support, enabling technicians to view users' screens and walk them through their problems.

Also included in the service is an unlimited number of service calls with a guaranteed four-hour response time, according to Hal Pawluk, senior vice-president of marketing. Each customer can designate four callers within his organization and use a toll-free number available from 6 a.m. to 5 p.m., Pacific Standard Time. More callers can be added for a higher fee.

Standard CSP also offers free software updates on all R:Base packages at a given location, discounted product upgrades, access to Microrim's electronic bulletin board, subscriptions to the Microrim newsletter, one evaluation copy of each product in the Microrim library, prereleases of all new products, membership in the advisory corporate council and a discount on training manuals, the company said.

For customers who prefer more attention, Microrim also provides the Premier CSP program, which incorporates the standard program plus a dedicated senior technical support representative, a guaranteed one-hour response time, two days of direct consultation — for which the company normally charges $75 per hour — and a two-day training session at the customer's facility, which would normally cost $3,000, Pawluk said.

The senior technical representative holds the responsibility of proactively addressing the most effective use of the client's information systems solution in addition to resolving any problems that may occur. Premier CSP is priced at $9,950, the company said.

The company said it will also continue to offer its Software Maintenance Plan, which provides individuals with toll-free phone support, updates, discounted upgrades and the technical newsletter.

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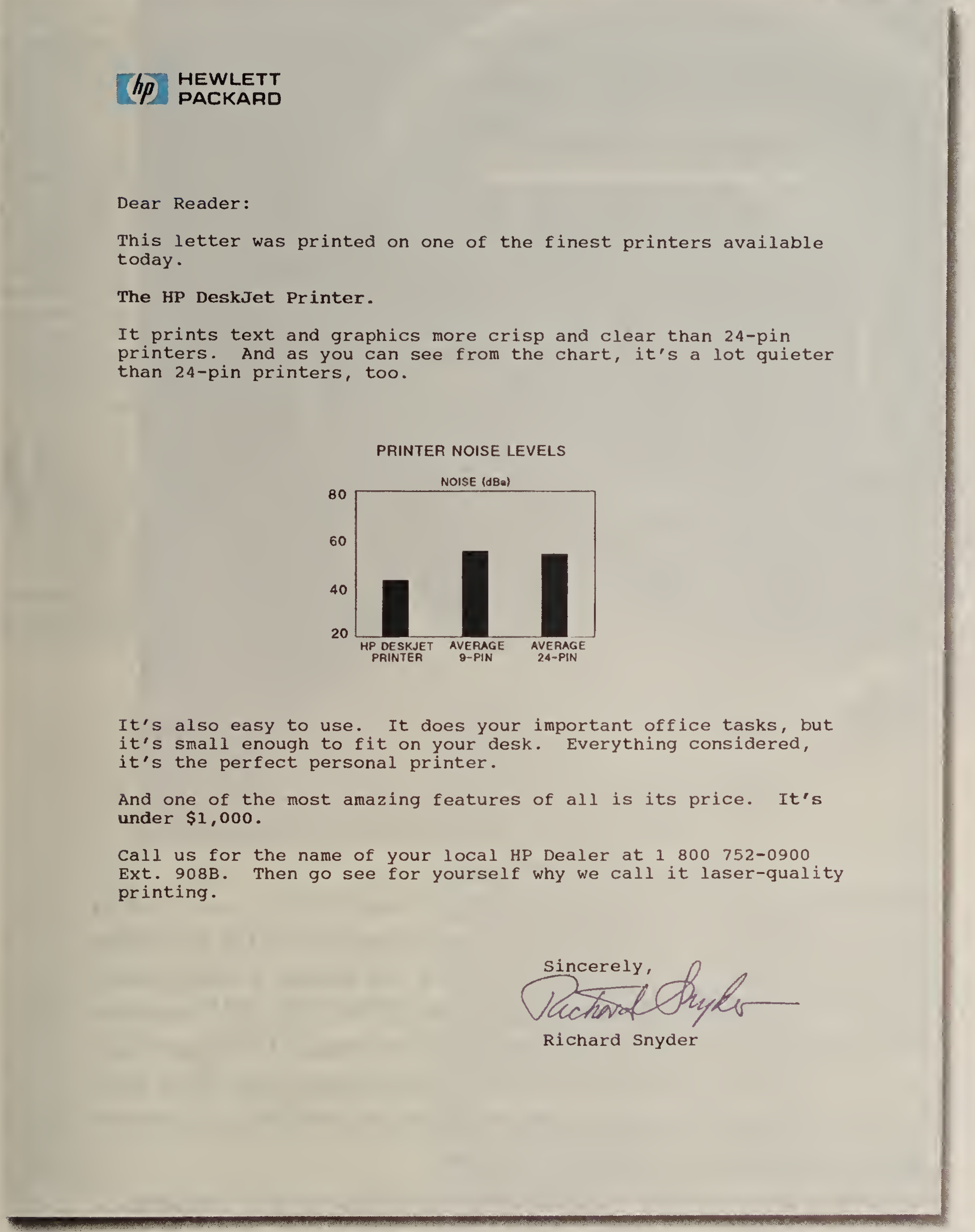

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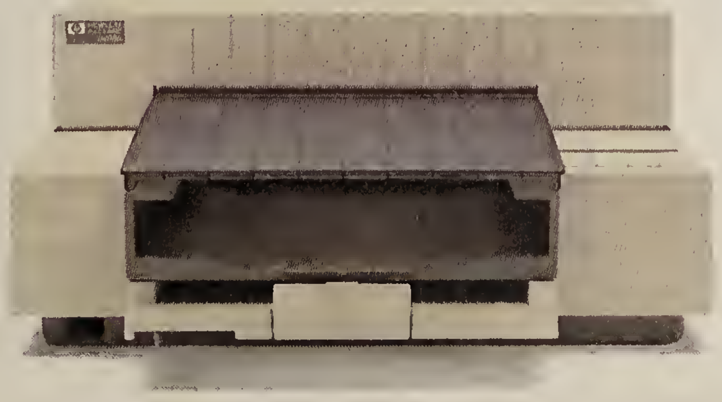

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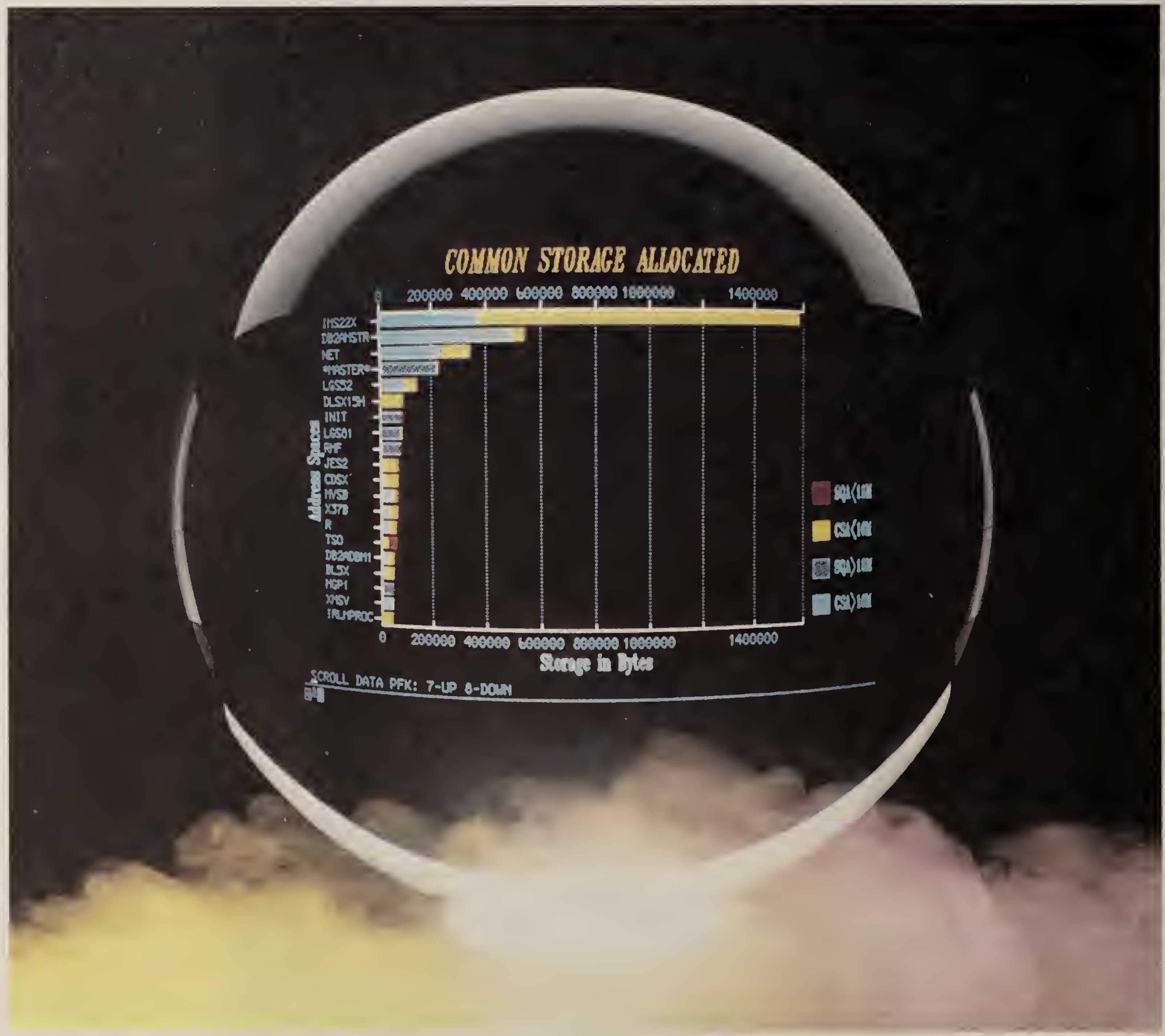

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Mac tool fuses math solver with spreadsheet

BY ALAN J. RYAN
CW STAFF

CHICAGO — General Optimization, Inc. has announced that its What's Best software will now work on the Macintosh with Microsoft Corp.'s Excel Version 1.5 spreadsheet and Apple Computer, Inc.'s Hypercard.

What's Best reportedly combines the spreadsheet with linear programming, which is a complex mathematical problem-solving system that generates best-possible responses to problems.

The General Optimization offering can be viewed as another sign that Apple's Macintosh continues to gain ground as a viable machine for the corporate office.

While working with Excel, What's Best allows the user to develop spreadsheet templates that represent a business problem, a spokesmen for the company said. Using a three-step optimization process, the linear programming package processes the problem and reportedly deposits the best-possible solution back into the spreadsheet model.

> WHAT'S BEST eliminates having to teach spreadsheet users the underlying mathematical algorithms associated with linear programming.
>
> SAM SAVAGE
> UNIVERSITY OF CHICAGO

Typically, the user will specify which spreadsheet cells the program can manipulate in its search for a solution to either minimize or maximize a particular aspect of the spreadsheet. The user can specify constraints that must be adhered to by the What's Best response. The program is menu-driven.

What's Best incorporates a specially licensed version of Lindo, a linear programming package commonly used in business administration. Lindo was developed by Linus Schrage, a management science professor in the University of Chicago Business School and chairman of General Optimization's scientific advisory board.

Sam Savage, who teaches linear programming at the University of Chicago, said What's Best eliminates having to teach spreadsheet users the underlying mathematical algorithms associated with linear programming. Instead, What's Best teaches its linear programming package how to read spreadsheet models. "A lot more people know spreadsheets than know linear programming," he said. What's Best will cost $149 for the Personal version, $995 for the Professional version and $1,995 for the Industrial version. The Personal and Professional versions require 1M byte of random-access memory, and the Industrial version requires 2M bytes. All versions three require a hard disk.

Virus

CONTINUED FROM PAGE 43

teach you to use another person's program" or whatever. You've been hit with a computer virus!

If you're lucky, you'll have a benign virus, and all you'll get is the message. But if you're that lucky, you'd probably have already won a major lottery and wouldn't have to worry about computer viruses. More than likely, the message preceded the virus trashing your hard disk. You may not get a message at all. And when you check your backup tapes or floppies, you'll probably find them contaminated.

The trade, business and local press have been telling us of the virus problem. Quoting learned business and technical representatives, the press tells us of the horrors that can be inflicted by viruses. And they're right — sort of.

There is no doubt that viruses can have a crippling effect on computing and for a variety of reasons. In truth, though, the damages reported to date just aren't that big a deal. It is the virus threat, not the virus problem, that is the thing to look at. And when we look at it thoroughly, we see that coping with the threat is actually a positive move for an MIS shop.

Computer viruses can appear in any class of computer, but their prevalence seems to be with personal computers. With the vast majority of PC-class machines being used by noncomputer personnel, this is logical. Viruses are replicating pieces of code, and the common practice of passing PC code around — via freeware/shareware, bulletin boards, LANs and so on — produces the ideal operational environment for the spreading of a virus.

The great utility of PCs is heavily dependent on using the code of others. Several popular and more expensive commercial products are readily available, but many PC users prefer packages that have come from the public domain. Even shrink-wrapped products from major software vendors have been contaminated. What's to be done?

The marketplace has been inundated in recent months with a flood of antivirus products. Any product will probably give

Continued on next page

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Continued from page 67

you some protection, and combinations of products, where they are not mutually exclusive, will give you even more.

For years, security consultants have been stressing the importance of proper security practices and policies. Without a solid-security methodology in place, the use of security products is not sufficient to protect computer systems.

Most companies have not experienced a sophisticated security breach, and their security personnel mistakenly have attributed this good fortune to their security products. The virus threat has them rethinking their positions.

We don't understand what viruses do, only what they've done. Therefore, all we can do is protect ourselves against specific past virus actions and against a few things we see that could happen.

But protect your boot sector, and there goes COMMAND.COM; protect COMMAND.COM, and watch the reformatting of your hard disk; protect the hard disk, and there go the floppies; protect the floppies, and your data gets hit; protect everything (ha!), and the security is so intrusive that you can't use your system. The only thing you can do is obtain reasonable protection and institute proper security, backup and recovery procedures.

Certain universities have reported viruses. Apparently, the virus is the contemporary version of dumping a can of paint on the head of the statue of the school founder.

A few companies, including several newspapers, have reported hits, but nothing that was really much more than an inconvenience. So, why the big concern?

It takes little imagination to see the tremendous vulnerability of large PC users to in-house attacks. Think of the computer techie dissatisfied with his last salary review. Wouldn't a virus be a nice going-away gift for the techie to leave the company before moving on to greener fields?

The only way you can protect against such a situation is via adequate security practices and procedures, including full audit and control functions.

David is a security consultant in Tappan, N.Y., conducting a study of computer viruses.

Barney

CONTINUED FROM PAGE 43

many will at least vaguely recall Predict, Silk, Surpass and Javelin, all of which failed to unseat the king because users and companies are simply afraid to learn something new.

Critics with faith in these "better" products have had Lotus on the ropes many times, but through it all, 1-2-3 has yet to change measurably. Maybe it is different now that Microsoft and Borland are the challengers to the aging spreadsheet. Maybe not.

So far, the new competition has failed to take chunks from the Lotus bottom line. Instead, Excel and Quattro appear to be crimping the style of older Lotus competitors, reshuffling the second string instead of replacing the star.

Keeping Lotus on top so far is a vast installed base. When new users come into corporations and need a spreadsheet, 1-2-3 is the natural choice, since Joe down the hall already knows how to use it. Add to this the confusion over whether the unshipped Release 3.0 will kick some Quattro and Excel butt, and the lack of defections to other packages make sense.

Lotus may be unscathed so far, but what's next? A big brouhaha over new markets, that's what!

Instead of depending on today's 1-2-3, Lotus will live or die based on new graphical and character-based versions of the venerable spreadsheet and a yet-to-ship database architecture that relies on spreadsheets as a key interface.

Aha! say the doomsayers. New markets are where old companies fail. Lotus' humiliating defeats in the Macintosh market and its poor showing in word processing and the scientific market seem to point to tough times ahead.

This time, Lotus isn't taking chances. Developers are staying up late crafting a whole new generation of interrelated packages aimed squarely at MIS. These packages will include more advanced networking features, graphics and perhaps a sprinkling of new technologies such as hypertext.

These products will start to appear next year, and Lotus competitors, particularly Microsoft, will be armed with a similar assortment. This is when the war starts. This is when Lotus will be vulnerable. This is when being a computer journalist will get real fun!

Looking for love. We recently reported on an off-site meeting of top Lotus honchos to discuss where 1-2-3 Release 3.0 stands. Although Release 3 must have been on the lips of the attendees, there was another, perhaps greater, purpose.

While Lotus may dismiss the executive exodus as coincidence or better opportunities, the company is worried. So down to Newport, R.I., they went to discuss corporate culture and think of ways to improve the environment at Lotus so people won't want to leave.

Hmmm. Instead of exchanging messages, employees could give each other massages. Instead of going through the ordeal of writing Release 3, they could buy VP Planner. How about beer kegs in the bathrooms? If you have any ideas for improving Lotus, call Jim Manzi, and tell him CW sent you!

Barney is a *Computerworld* senior editor, microcomputing.

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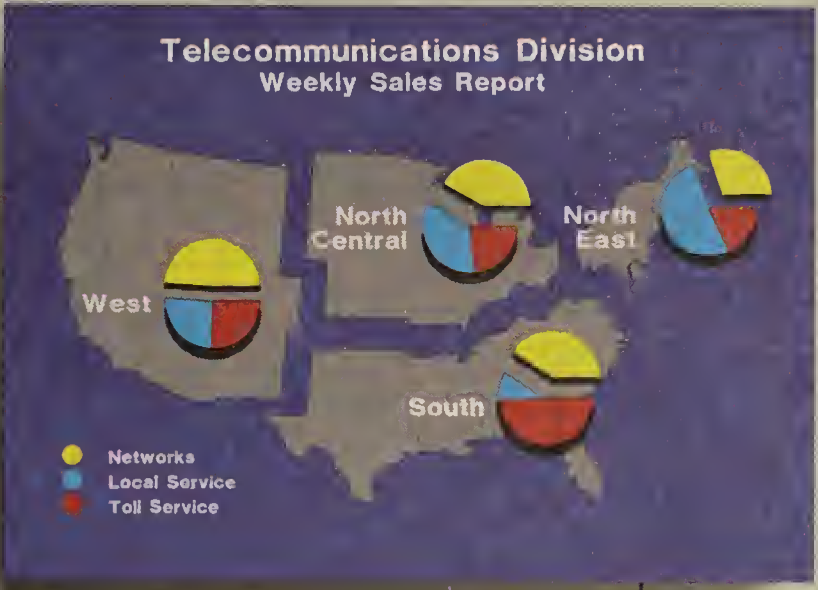

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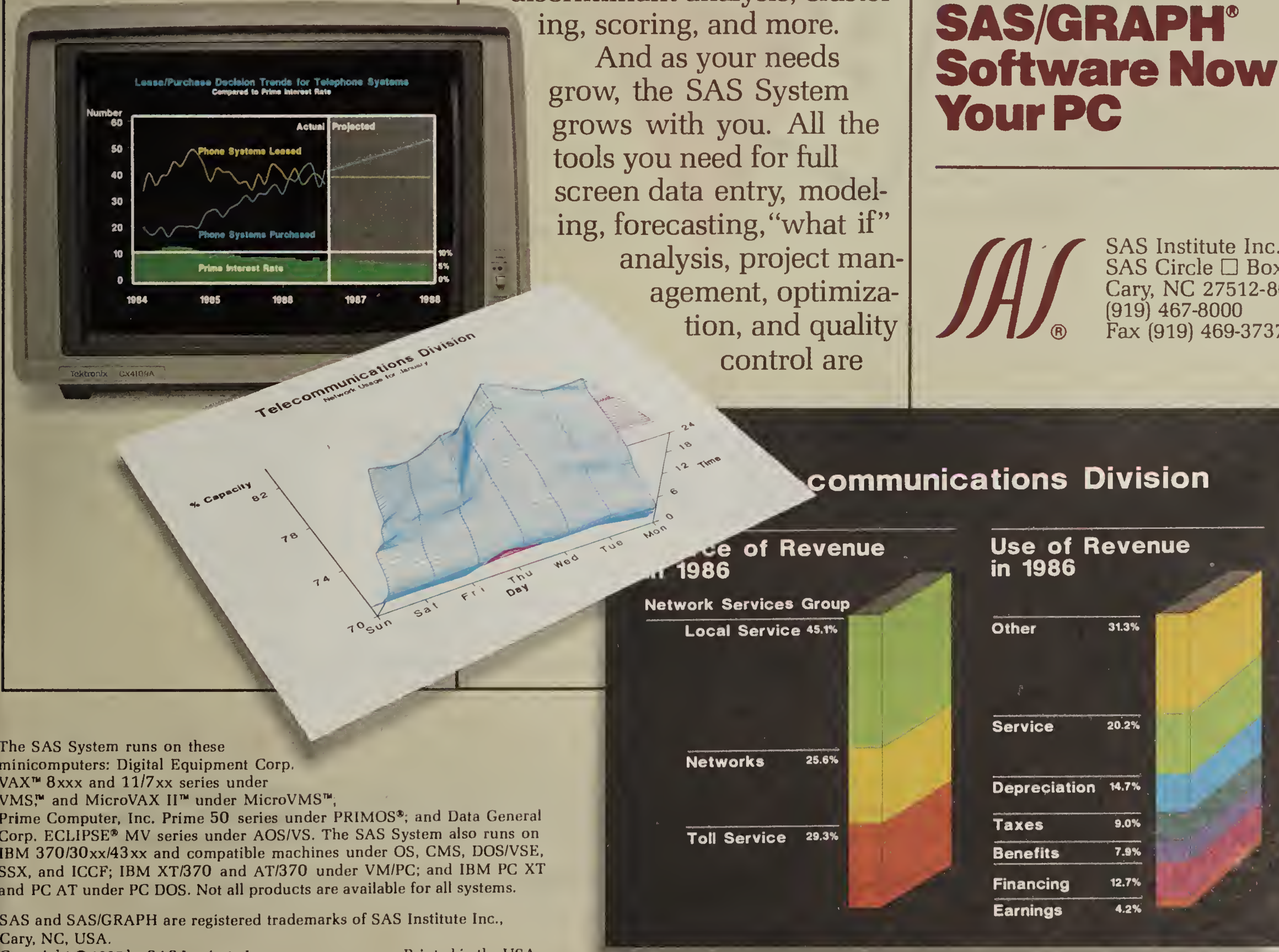

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Losing

CONTINUED FROM PAGE 43

Tandon Corp. disk system.

But the American-made technology on the foreign vessel has been less of an issue than the controversy over the fairness of the best-of-three races. New Zealand's team claims the race is unfair because the U.S. *Stars & Stripes* is a multihulled catamaran, while the New Zealand yacht is a monohulled vessel.

Graeme Colman of the *New Zealand* said the rules of the race call for a match. "Match racing in yachting is a contest between equal boats," but this race will be between unequal boats, and the outcome is likely to be challenged in court, he said. "We've built the fastest monohull on earth," he said, adding that some have already labeled the match the competition between a tortoise and a hare.

All aboard

There are three computer systems aboard the *New Zealand.* One, using an HP Vectra and Tandon's Ad-Pac removable disk subsystem, is called Sailvision and is the challenger's state-of-the-art technology, according to Colman.

The system includes a mast-mounted video camera that takes one shot of markings on the sails and the deck every one-third of a second to record the sail shape and twist characteristics. Stress at many different points on the mast and rigging is also measured and recorded by a second on-board system.

When the 40-member New Zealand crew is racing, Colman explained, these systems will analyze the current sail shapes, which can be overlaid on historical data for feedback in real time on how to trim the sail.

A third system combines an HP Vectra with an HP 9000 Model 330 to collect, display and record boat performance data and to act as a navigation system.

Using the removable disk packs, the crew can transfer sailing data from the ship-based systems to identically configured systems on shore during prerace activities. That data can be further analyzed on shore and be used later when the race takes place.

Richard Morris, electronic equipment manager for the *New Zealand,* said the ability to expand the HP system and the ruggedness of the Data Pacs "have given us a comprehensive analytical system with the assurance that no vital information will be lost in the sometimes violent movement of our yacht."

Colman explained that the sea puts tremendous load strain on all the gear but that the computers have been free of breakdowns. "Even with all the salt air and rough seas, we haven't had any problems with them," he said.

A computer system was also used to help design the sails of the New Zealand yacht.

The technology extends to the *Stars & Stripes* as well. Between the two vessels, HP computers alone amount to nearly $1 million in equipment. The U.S. catamaran's hulls were designed using the HP 9000 computer-aided design systems, and the crew is using a HP-71 handheld computer for course navigation.

State of the art *doesn't mean a win*

End users get SAS freebie

BY MICHAEL ALEXANDER
CW STAFF

CARY, N.C. — If you are an end user of the SAS System for PCs, SAS Institute, Inc. has a deal for you. The firm is offering at no charge a menu-driven interface called SAS/Assist said to provide quick access to basic SAS System tools for data analysis, report writing and graphics.

The product is a task-oriented system designed to enable users to accomplish basic SAS System tasks with little effort, company spokesmen said. It was developed using the screen control language of SAS/AF software, the applications development component of SAS System.

The first release of the software will be enhanced when more of the company's customers get a look at the product, said Barrett Joyner, SAS marketing manager.

While the first installment of SAS/Assist is not designed as a front end to all the capabilities of the SAS System, it includes such features as reading data from a flat file in an SAS data set, generating descriptive statistics and statistical reports and creating presentation and information graphs, according to the company. There is also a desktop tools section with a calculator and telephone directory.

SAS/Assist is being shipped automatically to current SAS Institute personal computer sites and will also be distributed free to new customers licensing SAS software under IBM PC-DOS and Microsoft Corp. MS-DOS.

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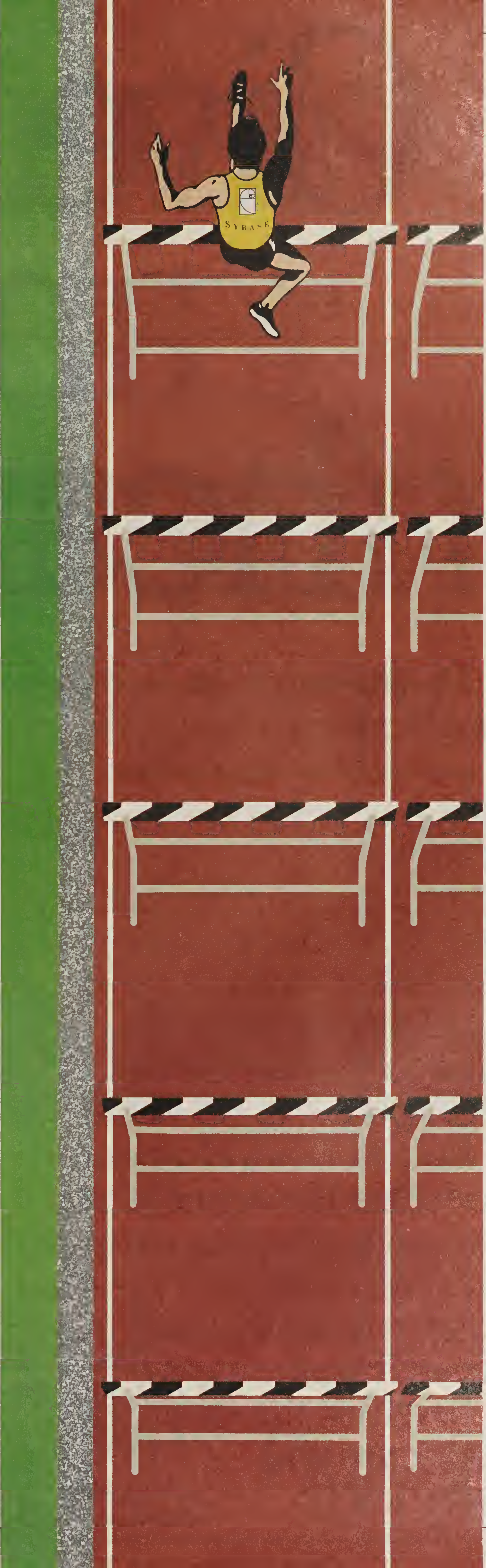

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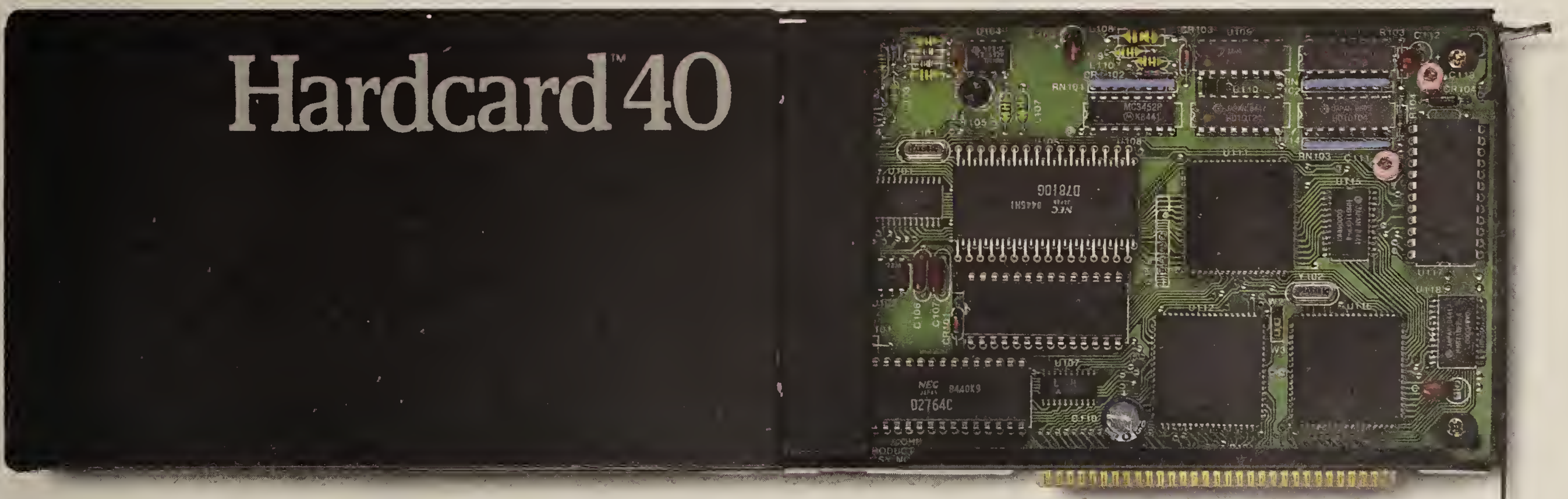

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DATA STREAM

Kathy Chin Leong

Get to know the phone man

Do you know your phone man? I mean, really know him?

We all know that before divestiture — that is, the era prior to Jan. 1, 1984 — the person who dealt with the telephone company representative was someone with the odd title "facilities manager." This facilities guru would take care of ordering the tie lines and telephone headsets and paying the bills for the company. The telecommunications site rep clearly had little to do with MIS and vice versa.

Today, however, it behooves MIS to take a serious look at what the Bell man has to offer besides voice lines. The Federal Communications Commission is yielding to pressure from the former Bell telephone companies to allow them to provide data services to residents and business customers.

And then there's the myriad of new technologies, including the Integrated Services Digital Network standard, that are being spearheaded by the telephone companies. They are also wandering into new territories such as packet switching, electronic mail and central office-

Continued on page 93

Net management gets academic

Technology center director educates business on telecom issues

Ivan Frisch was appointed last July as director of New York state's Center for Advanced Technology in Telecommunications (CATT), which is part of the Polytechnic University in Brooklyn, N.Y. The center collaborates with private-sector companies in research, development, education and technology transfer. *Computerworld* Senior Editor Elisabeth Horwitt talked to Frisch about his goals for the center, which include making it "the nation's preeminent research center for network management and control."

The CATT's Ivan Frisch

What does the center offer private companies in terms of education?

We offer two weekend executive programs for a two-year master of science. One teaches management of computers and communications systems. It's for people who grew up in the communications industry but have no management degree or people with management degrees and limited technical training.

The other program provides data processing education for telecommunications professionals who are suddenly being pushed into computers, and vice versa.

What areas of research are you involved in?

One is materials, such as high-speed switching media. A second is devices. For example, we are working on a LAN that allows people on the stock exchange to input information directly into the exchange's computers

Continued on page 82

Japan firm to sell AI tool know-how

BY LORI VALIGRA
IDG NEWS SERVICE

OSAKA, Japan — IBM Japan Ltd. and Sumitomo Metal Industries Ltd. announced recently that they have codeveloped an expert system to control on-line computer networks. The AI-based technique, expected to raise network operation efficiency by 60%, will probably be offered commercially by the steelmaker in the near future.

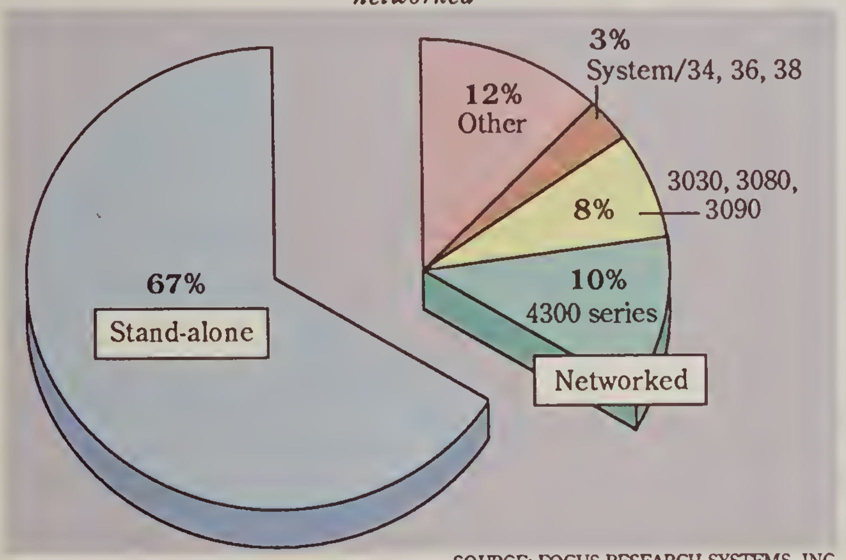
Sumitomo initiated the so-called Spark project in April by proposing to create an expert

Continued on page 87

Data View

IBM's 9370 often stands alone

Two-thirds of current and planned 9370 installations are not networked



SOURCE: FOCUS RESEARCH SYSTEMS, INC.
CW CHART

Stress seen hobbling productivity

BY PATRICIA KEEFE
CW STAFF

WASHINGTON, D.C. — As with the so-called Yuppie disease — chronic fatigue — it's easy to dismiss stress as one of the more chic '80s maladies. But let's face it: Communications management can be pretty hairy.

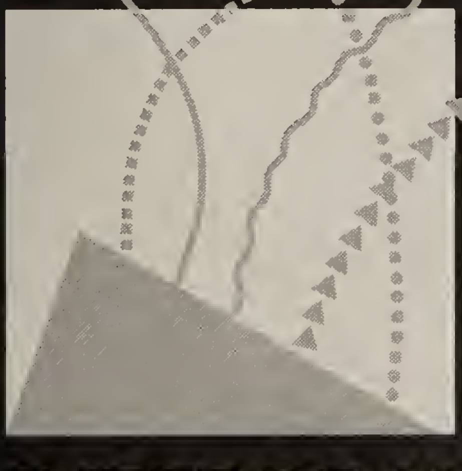
With that in mind, the most recent issue of "Cmagazine," which is published quarterly by the Communications Managers Associations, Inc. (CMA), has taken a look at stress and its effects on productivity and management.

Ask any telecommunications manager where stress comes from and you're likely to get a response something like, "Where shall I begin?" Recent *Compu-*

Continued on page 91

Inside

- PC-based GOSIP products roll. Page 82.
- Three network firms snag investment dollars. Page 93.
- Crystal Point adds gateway for UB, Netbios networks. Page 97.



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TPX–The choice for session management.

As the number of online users increases, networks and access to them become increasingly complex. Network users must be able to access information quickly and easily, but selecting the best approach for serving these users can be difficult. The following companies recognized the best choice for session management is TPX (Terminal Productivity Executive) from Duquesne Systems.

TPX is a group of integrated services that improve productivity for users of online systems. It is a full-function, VTAM-based session manager for MVS and VM environments. TPX offers network-level services which include session portability and security system interfaces. It also supports concurrent connection to several online applications and enables users to switch among them using a single command or PF key. Session automation and network-wide messaging capabilities are also available as optional services, and a data compression option reduces network activity, providing significant savings.

"I've been involved in evaluations of TPX at three different sites and have evaluated other session managers as well. TPX is the top-of-the-line in session managers in my mind. We were especially pleased with the security system interfaces that allow us to maintain security from a single point of entry."

Tom Learned
Senior Data Communications Specialist
Fleet Information Inc.

"We're impressed with the quality of technical support Duquesne Systems offers. There's always someone available to answer questions, solve problems, or discuss ideas. When we call, we usually get instant response to our needs. We wouldn't have gotten as far with session management without TPX and top-grade support."

Terry Sprigg
Engineering Mgr., Information Systems
Royal Trust

"We have more than 2,000 users defined to TPX—1,000 of which may be active at peak times. This translates into about 2,500 active sessions on our 3090-400 with TPX responsible for only 2% of the CPU resource consumption. We consider this a small price to pay considering the increase in user productivity."

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PBX vendors pressured for ISDN links

AT&T, Rolm about to deliver standardized Basic Rate Interfaces, but other firms still delay

BY ELIZABETH HORWITT
and KATHY CHIN LEONG
CW STAFF

AT&T and Rolm Systems are reportedly on the verge of announcing Basic Rate Interface links that will allow user devices to access Integrated Services Digital Network (ISDN) connections through their switches.

However, Northern Telecom, Inc. and Wang Laboratories, Inc. subsidiary Intecom, Inc. are still vague about when — or even whether, in Intecom's case — they will begin supporting the industry standard.

Most major vendors of private branch exchanges (PBX) have announced support within the last year for the ISDN Primary Rate Interface, a 1.5M bit/sec. connection that can be used to link their switches to each other, to hosts or to carriers' ISDN services. However, PBX vendors have competitive reasons for delaying support of the ISDN Basic Rate Interface, which will be generally used to link local user devices to in-house networking switches, according to Bart Stuck, vice-president of Probe Research, Inc. in Cedar Falls, N.J.

Why bother?

As a standardized, public-domain connection, the Basic Rate Interface makes it all too easy for third-party vendors to attach their voice and data devices to proprietary PBX systems, Stuck explained. "Why should vendors go through the R&D expense of developing and implementing the standard [on their products] when someone else can come out with a nicer terminal to plug into their PBX?"

Nevertheless, PBX vendors may not be able to stall for much longer. Market demand for Basic Rate Interface products is growing.

Hector Myerston, telecom manager at the Stanford Research Institute and a user of Northern Telecom's SL-1 switch, said he expects that users such as himself will be demanding that vendors support ISDN interfaces. "If I were to buy a PBX switch today, my supplier better tell me that an ISDN interface card for Primary Rate Interface or Basic Rate Interface will be available. I want to be able to take advantage of public services."

At the University of California, Los Angeles, Director of Telecommunications John Terrell admitted that he is not sure what benefits ISDN will bring to the campus. However, he said ISDN support will be a requirement, since the networking community is heading in that direction.

Responding to this burgeoning demand, AT&T said it will introduce a Basic Rate Interface module for the System 85 in its next round of enhancements to the PBX, which will take place within six months. The System 75, which also lacks Primary Rate Interface support, may not get a Basic Rate Interface for two years, a spokeswoman indicated.

> "WHY SHOULD vendors go through the R&D expense of developing and implementing the standard when someone else can come out with a nicer terminal to plug into their PBX?"
>
> BART STUCK
> PROBE RESEARCH

In a few weeks, Rolm Systems intends to publicly demonstrate a prototype Basic Rate Interface card for its 9750 switch, said Bob Jordan, Rolm manager of systems requirements. Users have said they expect the announcement to be made at the Telecommunications Association show during the last week of this month. Jordan acknowledged that Rolm is also pursuing development of a Primary Rate Interface card and that a dual introduction would make sense.

On the other hand, Intecom has not decided when to deliver the Basic Rate Interface board to the market, according to Joe Goldman, ISDN product manager. "Since we sell large PBXs that support up to 5,000 stations, we think that the Primary Rate Interface card is most desirable for us to produce initially." The company expects to deliver a Primary Rate Interface card for its PBXs by early 1990, he said.

Northern Telecom recently came out with an "ISDN-like" 64K bit/sec. link that reportedly gives synchronous devices access to the Primary Rate Interface as supported by the vendor's SL-1 PBX. Described as an "interim product that doesn't preclude Basic Rate development," the box does not provide true ISDN compatibility. Northern Telecom gave no indication when a true ISDN link would be announced.

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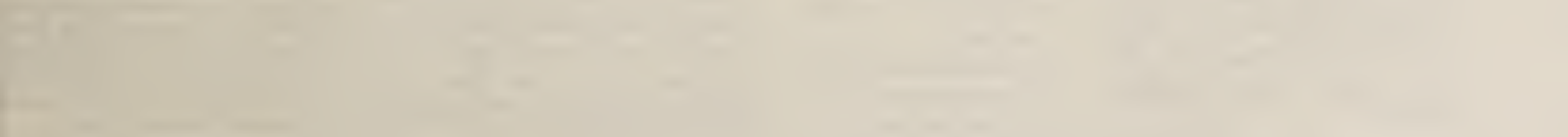

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PC-based off-the-shelf GOSIP products roll

BY PATRICIA KEEFE
CW STAFF

SANTA MONICA, Calif. — Retix Corp., a supplier of Open Systems Interconnect (OSI) software, recently announced what it characterized as off-the-shelf OSI products targeting the U.S. Government OSI Profile (GOSIP) market.

Now a government mandate, GOSIP defines components of the OSI model, which, when combined, form the services and interconnectivity required by government organizations.

The software offered by Retix is designed for AT&T Unix System V, Release 3-based personal computers and compatibles. The product rollout includes three OSI applications, two coprocessor cards and Unix transport software.

The three packages are CCITT X.400 Message Handling, ISO FTAM and X.500 Directory Services. All applications include configuration and utility routines, Retix said.

An applications programming interface is provided with the X.400 package for use with services such as electronic data interchange. The X.500 product is said to provide centralized directory storage and retrieval functions, while FTAM supplies server and client functionality in the Unix environment.

Also available are two coprocessor cards with on-board OSI transport software, Retix said.

The PC-620 802.3 LAN Coprocessor card comes with Retix OSI Transport Layers 1 through 4 and reportedly supports connectionless Ethernet or Thin Ethernet connectivity. The PC-320 WAN Coprocessor card is configured with the same OSI layers, and is said to support both connection-oriented and connectionless network services for one or two CCITT X.25 networks or private lines.

Both cards feature 1.5M bytes of random-access memory and can be used with IBM Personal Computer ATs and Intel Corp. 80386-based PCs under Unix. Retix claimed the boards are capable of hosting the full seven-layer OSI stack.

A Unix Streams version of the OSI transport software incorporates OSI's Lower Layer Interface, reportedly enabling it to support nonintelligent local-area network adapter cards. Also supported is AT&T's Transport Layer Interface.

With the exception of the X.500 service, product shipments are scheduled to begin in the fourth quarter. The X.500 software is slated to ship in the first quarter of 1989. Microsoft Corp. MS-DOS versions for PC-based platforms reportedly will also be available in that time frame.

Academic

CONTINUED FROM PAGE 77

via radio. The third is systems, such as fast switching, imaging and T1 networks.

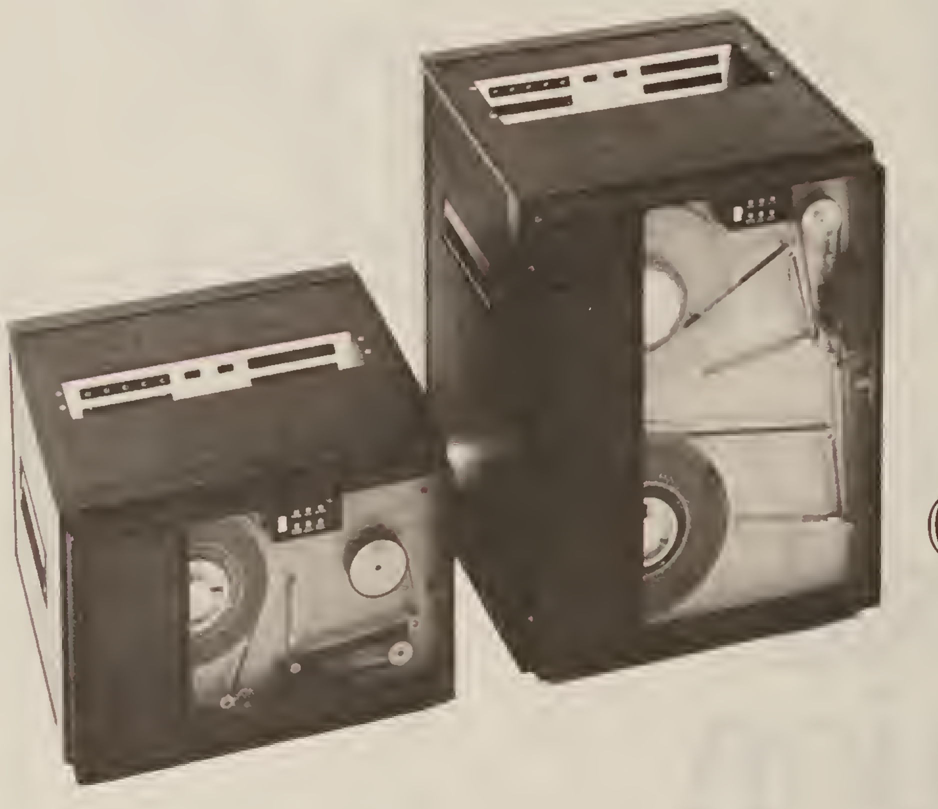
Can you talk about your private-sector development projects?
Security Industry Automation Corp. is using us to see how network management products can evolve toward standards and how their Tandem, IBM and Intel systems can be brought into those standards. And we are working with Nynex on a network management system that allows them to view and control multiple networks from one of their control centers.

What are the major network management problems you are trying to help companies resolve?
One is how to develop an intelligent system to pinpoint problems on a network. A lot of systems are homegrown and undocumented, so no one knows what's in them. One company had a packet-switching network whose response time kept worsening. They finally figured out that 10 years ago, someone had put in an algorithm that all messages from New York to San Francisco had to be routed through Chicago, and Chicago's local traffic was slowing things down. But no one knew the code to figure this out.

Another problem is that no one knows what information to collect or how to act on that information. If you put DEC and IBM together and something goes wrong and the message is lost, what do you do?

A third problem is the lack of coordination among different aspects of network management within one company. You have separate departments growing, each with its own domain, computer and database: one for procurement, one for chargeback, one for maintenance, one for contracting. Network management standards will offer a framework for linking these different systems but will not optimize the database to perform these functions — you want to have one database that they can all access efficiently.

What can an academic institution offer in this area that the private sector cannot?
We have a viewpoint that crosses different companies and industries. We are not developing a product for sale but have the flexibility to integrate and examine different companies' products. And grad students working on doctoral theses often come up with original viewpoints that may not have come up in industry.



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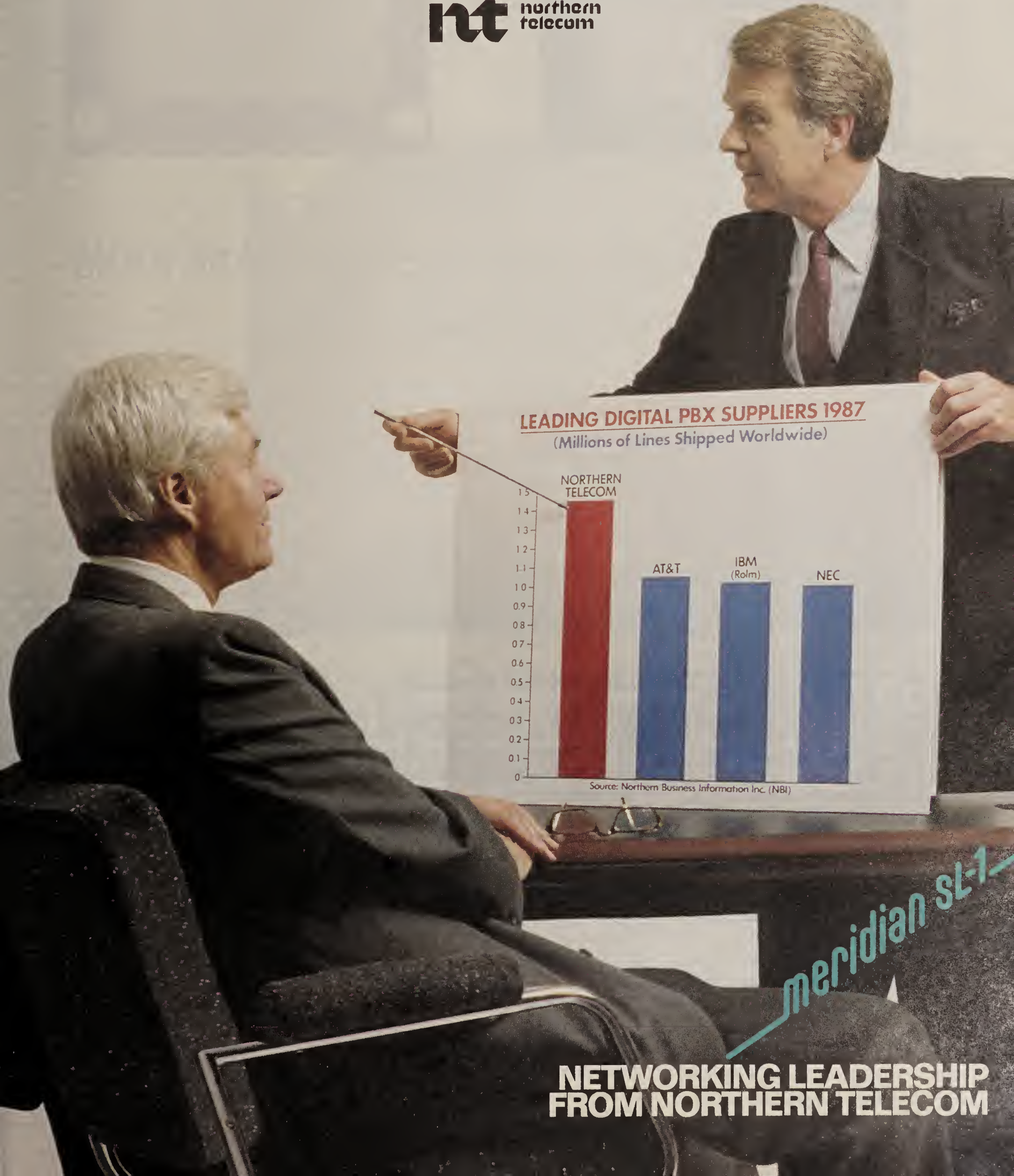
LEADING DIGITAL PBX SUPPLIERS 1987
(Millions of Lines Shipped Worldwide)
NORTHERN TELECOM
AT&T
IBM (Rolm)
NEC
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
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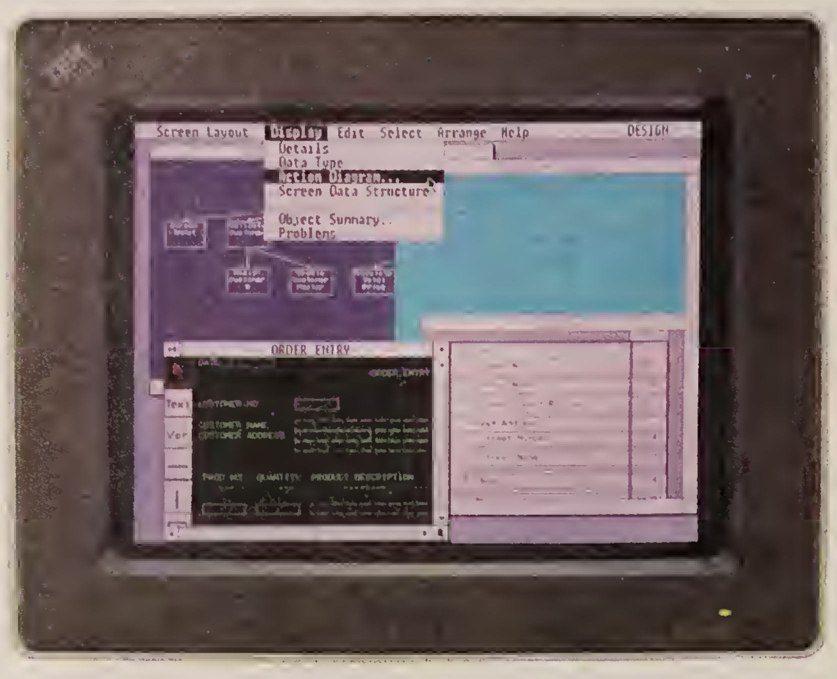
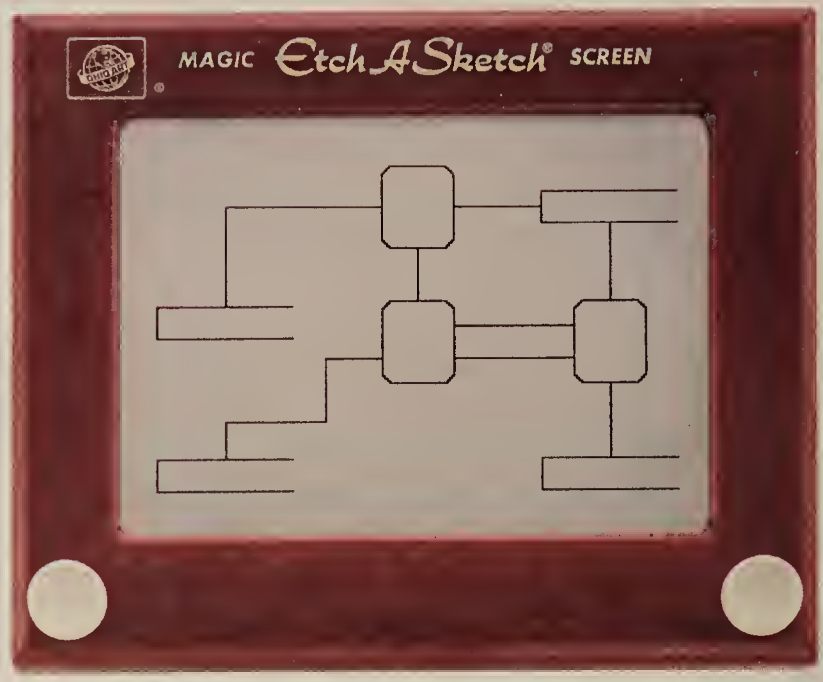
Source: Northern Business Information Inc. (NBI)
meridian SL-1
NETWORKING LEADERSHIP FROM NORTHERN TELECOM





Compared to KnowledgeWare CASE tools the others look like toys

Drawing diagrams on a screen sure beats pencils and plastic templates. And if drawing diagrams is all you want, just about any tool will do.

But most people want a tool to assure high quality system specifications and designs. And hundreds of CASE users have "graduated" to KnowledgeWare's *intelligent* CASE solution, the Information Engineering Workbench® (IEW). Here's why:

Dictionary-based tools can't assure consistency

Most CASE tools are dictionary-based. They store graphic components of diagrams (boxes, lines, arrows, etc.) in one file…and store descriptions separately in a dictionary. You have to create diagrams, *manually* describe what they mean, then *manually* link the descriptions to the diagram components. If you forget anything, the diagrams get out of sync with the dictionary. And this leads to inconsistent systems specifications and designs.

KnowledgeWare's Encyclopedia guarantees consistency

KnowledgeWare tools *interpret* the actual meaning behind diagrams (object types, relationships, associations, etc.) and store that information in a single knowledge-based "Encyclopedia." Request a diagram and our expert system *draws* it from stored knowledge. So it's *impossible* for diagrams to be inconsistent with the Encyclopedia.

Keeps all diagrams up to date all the time

The specification and design of computer systems requires iterative changes. And each change can impact many diagrams. With most dictionary-based CASE tools you must repeatedly update every affected diagram, because each is an independent picture.

It's much easier with KnowledgeWare CASE tools. Each time you enter or modify information through a diagram, the expert system updates the Encyclopedia. And all diagrams automatically reflect current knowledge.

Enforces the rules of computing

Most CASE tools allow software engineers to specify and design systems that can't be constructed. Their diagrams may have missing inputs, circular relationships, or outputs that go nowhere.

KnowledgeWare's realtime expert system automatically checks and enforces hundreds of logic rules. It calls attention to errors and inconsistencies. And it checks for completeness. All without limiting you to any particular methodology. This automatically assures that specifications and designs can be translated into real systems.

Automatically redraws information in other formats

A dictionary-based tool that stores diagrams as boxes, text, and arrows can reassemble those parts on the screen. But you only get back the same diagram that you put in.

Since KnowledgeWare CASE tools store objects and relationships, you can display that information in various ways. For example, use our Analysis Workstation to draw a Data Flow Diagram. The Analysis Workstation can then automatically construct the corresponding Process Decomposition Diagram.

Provides a state-of-the-art user interface

Most CASE tools have not kept pace with advances in user interface technology. Some may even require you to learn different interfaces in different parts of their product.

KnowledgeWare workstation tools are mouse-driven with pull-down menus. You can view many diagrams and definitions at the same time in multiple windows – and in different colors. You can zoom in and out, nest diagrams, mask out distracting elements, and highlight the path of information through a number of diagrams.

For more detailed information on KnowledgeWare's Planning Workstation, Analysis Workstation, and Design Workstation, or any of our mainframe CASE tools, **call 1-800-338-4130 toll-free** (in Georgia, call 404/231-8575).

KnowledgeWare®

The World's Most Comprehensive CASE Tool Set™

KnowledgeWare, Inc.
3340 Peachtree Rd. N.E., Suite 1100
Atlanta, Georgia 30026.

KnowledgeWare software products are available from KnowledgeWare sales offices in the U.S. and from Arthur Young International member firms outside the U.S. Ohio Art's Etch-A-Sketch® Magic Screen is available at toy stores everywhere.

Japan firm

CONTINUED FROM PAGE 77

system-based diagnostic tool for its steel-production systems.

Co-developed with IBM Japan, the system is based on a Japanese version of IBM's Knowledgetool software.

The system automates the fault-checking process in case of a network failure. It reportedly stores about 1,100 knowledge-based rules devised by network control experts. Using conventional computer languages, a functionally similar program would require approximately 20,000 instructions, according to the firms.

Complete control

Starting next month, Sumitomo plans to use the system for a network linking its offices and plants. The system can completely control the computer and network systems, the company said. It uses IBM's Netview network management software to observe system activities. When trouble occurs, the system automatically gathers error information from the network.

An AI database that lists error information helps the system automatically fix simple errors such as terminal power or modem failures. In the case of a bigger problem, the system turns on a control-panel light or sounds a buzzer to call an operator.

Tatsuro Kawaguchi, an engineer at Sumitomo, said his firm has tried for a long time to set up a system that did not require operators to sit constantly at its four IBM 3090E mainframes, which run IBM's MVS/XA or IMS, and at its several large NEC Corp. mainframes.

The project with IBM Japan partially met its goal. With the automatic error detection, operators need not constantly monitor the system as they did before, and they can do other work, Kawaguchi said. The company has three people monitoring the system now. Typically, such a setup would require seven to 10 people to run it, he added.

Knowledge consolidation

To set up the expert system database, Sumitomo gathered operation know-how from operators who were manually running the production system at its Kashima Center factory near Tokyo. Sumitomo gathered 1,100 knowledge rules, the equivalent of 20,000 conventional instructions, and put them into a database using IBM's Knowledgetool and DB2 software. It is this knowledge of applying AI to diagnostic systems for IBM Systems Network Architecture networks and computers that Sumitomo said it is planning to sell.

Kawaguchi said the technique may be applied to other large-scale systems such as those in banks. Sumitomo's offering will likely be limited to Japan at first because the system's programs are in Japanese.

The price depends on the system scale, Kawaguchi said. A 3090 system customization, for example, will be priced at about $751,880. The buyer receives customization services and a consultant to construct the network but not the steel production system hardware or IBM software.

IBM Japan spokesman Mac Jeffery said his company is waiting to see how Sumitomo does with the service before deciding whether to sell the system.

Interlink plans incorporation of SNA net functions, LU6.2

IBM has agreed to help **Interlink Computer Sciences, Inc.** incorporate IBM Systems Network Architecture network management functions and LU6.2 protocols into future Interlink products, the companies announced. Interlink provides gateways between IBM and Digital Equipment Corp. systems, which IBM is said to offer through its Industry Marketing Assistance Program.

Atlantic Research Corp.'s Teleproducts Division and **Vance Systems, Inc.** have announced an alliance to jointly develop testing, analysis and network management products for wide-area (WAN) and local-area networks. Delivery of these products is scheduled to begin late next year.

In addition, Atlantic Research announced that it will immediately begin offering Vance Systems' token-ring test equipment along with its own WAN testing line.

Waterloo Microsystems, Inc. announced it has shipped approximately $1 million in software products to IBM Canada Ltd. The products will be integrated into IBM's Educational Network (Ednet). More than 1,000 networks based on Waterloo's Port network operating system will be installed in the Ontario school system as part of Ednet.

Arthur D. Little, Inc. will commence selling **Nestor, Inc.'s** neural network products to the financial services and industrial markets. Nestor has also consummated a licensing agreement with **Morgan Stanley & Co.** that will use Nestor's proprietary Decision Learning System neural network for equities trading.

TI's OmniLaser 2106.
The laser printer for today, tomorrow, and when there is no tomorrow.

When your success depends on making great-looking documents, you need a laser printer that's versatile enough to handle just about anything that comes up. That printer is Texas Instruments OmniLaser™ 2106.

This quiet, six-page-per-minute laser printer comes with all the capabilities you need to produce word processing, spreadsheets and other PC applications. It also comes standard with Adobe™ PostScript®, the magic behind desktop publishing. So you get unsurpassed control over type, graphics and page composition. All from the top of your desk.

Beyond word processing.
Today, people in every pursuit are changing to desktop publishing to give their documents an edge. With over 600 software packages supporting PostScript, TI's OmniLaser 2106 gives you the power to print today's documents and then go far beyond. Because not only does the OmniLaser emulate the HP LaserJet Plus™, it also features Adobe PostScript. So your documents look better, communicate faster and sell harder.

TI's OmniLaser 2106 with PostScript gives you excellent control over type, graphics and page composition.

Improve your standard of printing.
TI's OmniLaser 2106 gives you great graphics, text that looks typeset and paper handling features that allow you to print on envelopes, legal size and more. It also features multiple industry-standard emulations and interfaces. All easily selectable at the touch of a button.

TI's OmniLaser 2106. It's the laser printer of your future, as well as the one you need right away. The OmniLaser family also includes the 2108 small-cluster printer and the 2115 shared-resource printer. **For a free brochure on how to choose a laser printer and information about TI's on-site warranty, call 1-800-527-3500.**

TEXAS INSTRUMENTS

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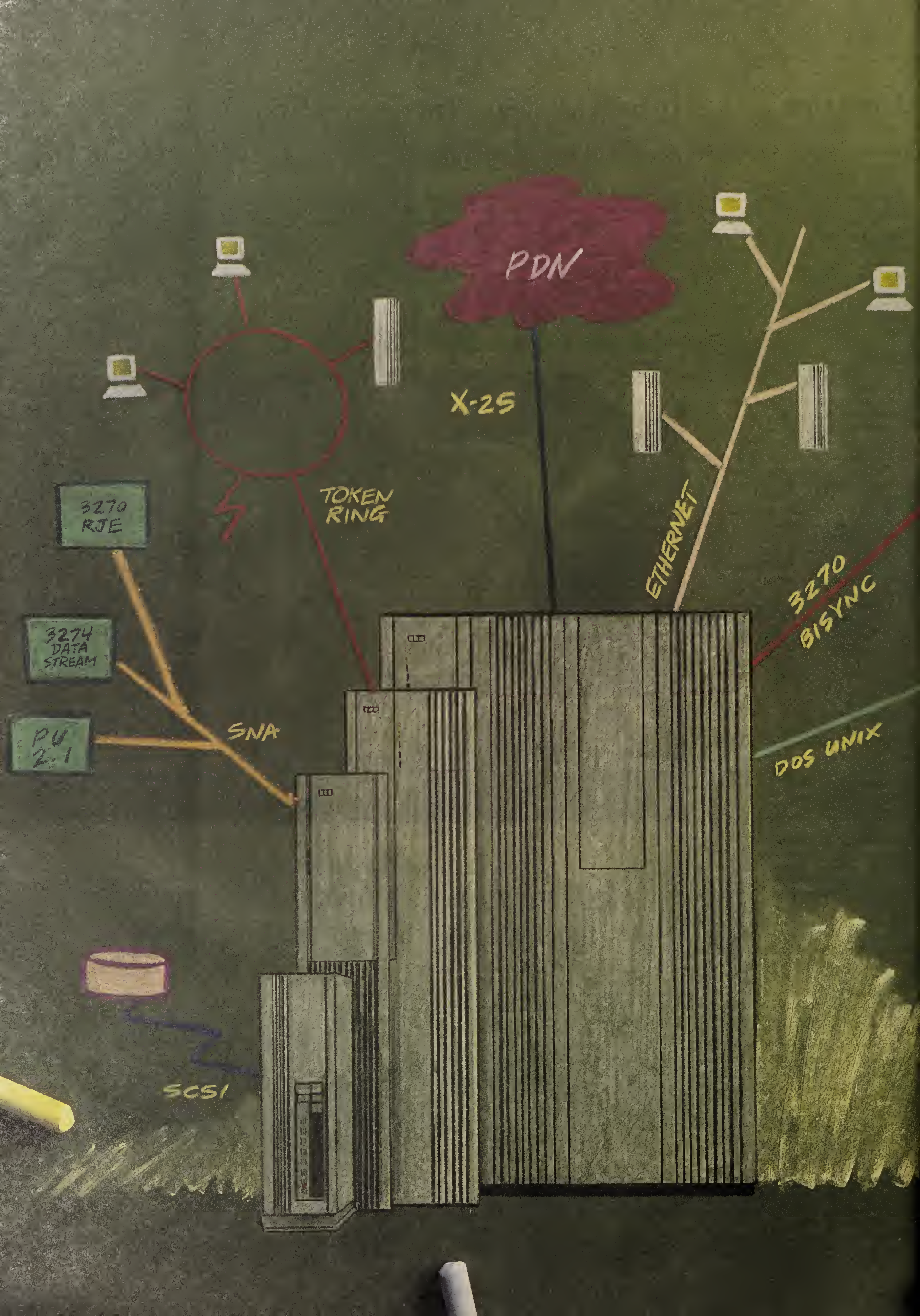

PDN
X-25
TOKEN RING
ETHERNET
3270 RJE
3274 DATA STREAM
PU 2.1
SNA
3270 BISYNC
DOS UNIX
SCSI

WE'VE ADDED A LOT OF BRANCHES TO OUR FAMILY TREE.

Good communications keep a family strong.

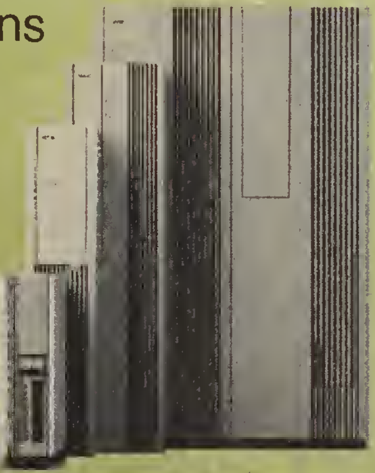
The NCR Tower® Family was designed to provide you with the best communications possible. As you can see from our diagram, we support all major communications protocols. So you can connect systems from mainframes to PCs in one heterogeneous network.

It's a total communications strategy to which others pay lip service, but which we deliver today.

We've strengthened our family ties.

Like any family, the Towers look alike and act alike. They're designed to be totally upward-compatible. So software that runs on one runs on the rest. That means your software investment is protected as you grow from Tower to Tower.

And since every member of the Tower Family can handle a wide range of high-speed, high capacity peripherals, your hardware investment is protected, too.



Whatever the future brings we'll welcome it to the family.

Our commitment to open systems has made us a leader in 32-bit UNIX systems. Of course, that commitment insures that the Tower Family is compatible with all today's standards. And it also means that you can count on us to support the emerging standards of tomorrow. Whatever they might be.

It's a commitment backed by the service and staying power of a $5.6 billion corporation.

Phone (800) CALL NCR today. And find out how our family connections can help make your business more successful.

THE NCR TOWER FAMILY.
A Smart Foundation to Build On.

NCR

Creating value

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And get the late-breaking news — before it's too late.

Windows open to 80386 power

High-octane Microvaxes roll

Lack of unity endangers the promise of DAT

BY JAMES A. MARTIN
CW STAFF

Although digital audio tape (DAT) is not available yet in the U.S. consumer marketplace, the new media is generating interest

DAT, or Data DAT (DDAT), as industry insiders call it, promises capacity of up to 1.2G bytes and storage rates of up to 10M byte/min. This represents an improvement over current standard quarter-in. tape cartridge systems with 150M-byte capaci-

Unisys adds 1100/90 models

Storage Tech boosts solid-state

BY JAMES CONNOLLY
CW STAFF

Codex reveals net manage

AT&T spells out net con

BY ALAN ALPER and ELISABETH HORWITT
CW STAFF

NEW YORK — AT&T last week announced plans for a unified network management architecture that potentially would allow

The architecture is expected to evolve during the next couple of years, AT&T said. The company intends to publish initial NMP specifications within the next few months.

DB2 advantages require hard sel

Development benefits over IMS seen

Wang takes Ethernet plunge

VS host links are first step on road

BY ELISABETH HORWITT
CW STAFF

NEC releases hard-disk Multispeed lapto

SOFTWARE NOTES

Broker workstation too

can put the entire VS family on Ethernet."

Wang's decision to implement 802.3 on the VS acknowledges growing support for 802.3 as an industry standard as well as user demand for cost-efficient connectivity between VS systems and other vendors' computers.

tions will be designed to replace quote machines with systems that can provide client information, portfolio analysis and modeling options.

MAP users group lays down law

BY KATHY CHIN
CW STAFF

Hot future for DP pros

IBM slow to reme

aky DB2 security

On-Line Software Introduces an Old Concept.

The Strateg

Casablanca...President Franklin D. Roosevelt and Prime Minister Winston Churchill find something to chuckle about during their historic meeting. (Credit: Bettmann)

Like it or not—and we do—we all live and work in an IBM world.

You work with IBM.

We work with IBM.

Let's work together.

Sure, there are proponents of minis and micros.

One wishful company even ballyhooed a mid-frame and when that didn't pan out they created a small-frame.

But the undeniable fact is that Big Blue has taken this industry and created it in its own image.

Pardon us if we seem a trifle unadventurous but we think we know a winner when we see one, so where IBM goes, we follow.

We fill their gaps. Plug their holes.

Write programs they don't have time for.

In short, make the whole thing run just a little bit better.

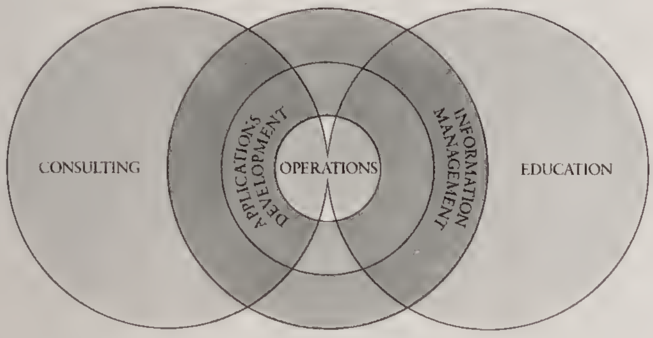
ic Alliance.

■ WE'RE LOOKING FOR A YES MAN.
OR WOMAN.
OR BOTH.

At most companies there are a hundred people who can say no but only a few who have the authority to say yes.

We're looking for those people. A few good men you might say.

And, at the risk of sounding high and mighty, there's something in it for you.



ON-LINE SOFTWARE'S THREE TIERED STRUCTURE

■ A CHANCE TO BE A HERO.

A chance to get ahead.

You see, managing a DP department is no different from most of life's other endeavors. It's not what you know, it's who you know.

Obviously we'd like for you to know us better. To make it easier, we've established special teams exclusively to service national accounts, federal systems, service bureaus and resellers.

Big guns for big hitters, if you'll allow us to mix a metaphor. What's in it for you?

Help.

Help with product evaluations, help with training, help with technical consulting and systems integration, help with applications development, operations and information management.

Sure, it's all available individually from other sources, if you have the time to wait for ten different phone calls from ten different reps.

We're betting you're too busy for that.

We're betting you're ready for an alliance, an understanding between yourself and a company whose charge in life is to take what IBM has created and make it better.

A strategic alliance.
It works in other businesses every day.
It works for politicians.
It works for lovers.
It even works for kids on the playground.
It worked for Roosevelt and Churchill.
It can work for us.

---

*"I WAS AN MIS DIRECTOR FOR 27 YEARS.
I ALLOWED ONE VENDOR LUNCH
EVERY TWO MONTHS.
I WAS NOT EASY TO SELL TO.
I WAS WRONG."*

A recollection from Howard P. Sorgen, President of On-Line Software

Personal experience. Can't beat it.

Especially if you've made a few mistakes and you've learned from them.

I have.

It wasn't that I was too smart or too powerful or too good to see all the people who had all that software they were trying to sell.

I was too busy.

I had a business to run so I did what all MIS managers do—leave it to my DP people to pick up a piece here and a piece there and make them fit.

It works.

It works great in the short run. And when you're so busy you can't see beyond the next project, that's the most most companies can, or do, hope for.

But take it from a guy who's been doing this for over 30 years.

Stop.
Sit back.
Relax.
Take a break.
Look around.

Find someone who has more to offer than just a piece of software. Someone who can help. Someone you can talk to, every day if you need to.

I did. I liked the way it felt, thought other DP managers would feel the same way, and that's why I'm at On-Line Software today.

By the way, my number's (201) 592-0009 and my extension is 2823. Call if I can help.

Before You Buy Another P
Ask Yourself a Simple

North Africa...U.S. paratroopers on the way to their next mission. (Credit: International News Photos)

The time has come for the big software rout. Little companies acquire big companies and big companies fight to hold their position against an onslaught of corporate raiders, disenchanted financial advisors and a skeptical Wall Street.

Those brilliant boys who sat in backrooms and changed the world can no longer afford to bring their product to a more complicated and more expensive market.

What used to be a craft is now a business, and that business is in turmoil. What used to be an innovative, entrepreneurial undertaking has been overwhelmed by a cover-your-butt mentality.

Rightly so.

Where will you be, who will own the software that runs *your* machines when the dust settles?

Systems software purchases are commitments. Commitments that ask *your* people to generate *your* work to satisfy *your* customers, a certain way for a very long time.

Changing that is rarely easy, always expensive.

WHAT HAPPENS WHEN YOUR FAVORITE LITTLE SOFTWARE COMPANY GETS EATEN UP BY SOMEONE YOU REALLY DON'T LIKE?

Pick up The Boston Globe, The Wall Street Journal, Business Week and you've got an arm load of software mergers, purges and shake-ups.

Some good. Some bad.

All affect you.

iece of Systems Software, Question. Is it Safe?

With a growth rate as high as 75%, constant new releases and several major acquisitions, On-Line Software started as, and remains, an exploding star.

In that atmosphere any company must work hard, very hard to keep its feet on the ground. Because all too often, asking a business partner to share in your glory carries an unspoken and unintended commitment to ride out your downfall.

It's a hard lesson, a lesson best learned from IBM—who we've mentioned many times before and we'll mention many times again. It's okay to take chances, it's even necessary to take risks, but never, ever pass them on to your customers.

■ BE CAREFUL WHO YOU BUY YOUR PROBLEMS FROM.

Safe. Is it safe? Is it a safe buy?

Safety is where it has always been.

In numbers.

In stability.

In support.

In growth.

In training.

In specialization.

In finding the high ground and holding it.

In an industry too often trying to be all things to all people, On-Line Software passes up many opportunities in order to solidify one position, to be authorities, authorities in IBM systems software.

In an industry whose raison d'etre is to sell more and more product, On-Line Software started by offering consulting, and now trains more people in the intricacies of IBM systems software than most anyone. In an industry in the midst of a shake out, we do the shaking, impervious to hostile takeover.

■ SO HOW DO YOU ELIMINATE THE INHERENT RISKS IN SOFTWARE PURCHASES?

Thirty-day trials help. But if you can feel secure with just a month's experience under your belt, you're better than most.

Look for specialization in IBM, especially in CICS and DB2.

Look for a company with a history of a new release for every product every year.

Look for tech support.

Look for educational offerings not only where the product is sold, but in the field where it is used.

Ask consultants and value added resellers which products they use to make their jobs easier.

Look for a company that asks smart questions.

Look for a company that comes to you.

Most of all, don't jump before you know what's down below.

THE NEW DEAL.

Things change.

In this business that's the name of the game.

So what seemed like a great decision—what was a great decision—a year ago can often turn into a worthless piece of software when your hardware changes or your operating system changes or your business changes or you just change your mind.

Until now all you could do was bite the bullet and wait for next year's budget.

That's all changed.

If you got it from On-Line Software, then just send it back.

Here's how it works.

License any On-Line Software product.

Take maintenance.

Use it.

Then, six months later—or six years later—if you're through with it or just don't need it or just want something else, trade it in, dollar for dollar, for another On-Line Software product.

That's it.

If you're looking for the fine print, there is none.

If it's an idea that sounds right for you, give me a call for the details.

Jack M Berdy

Jack Berdy, Chairman and CEO

P.S. I want to ask a favor—a small one, I hope.

As far as we know right now, no other company offers a guarantee that even comes close. In fact, as far as we know, no other systems software company has any extended guarantee at all.

That too will change. Sooner or later, they'll all have to do it just to keep up.

So the first time you hear some software sales rep going on about his company's great unconditional guarantee, please remember that it all started right here.

Thanks.

The DP Ass

The Homefront...Dedicated workers are the backbone of any modern operation. (Credit. UPI)

If you're over 30 you probably remember the ads on the inside of match book covers, "Learn To Be A Key Punch Operator And Enter The Exciting World Of Computers."

Now, with 1990 less than 500 days away, it all sounds so naive, doesn't it?

Well, that's the way a lot of people got started. It beat working in the mill or answering the phone all day. To be fair it still does.

But the glamour's gone.

Today there are 900,000 DP professionals in the United States.

There's only one problem. We need almost 2,000,000 more. We measure backlog not in days or months but in years. Years!

Ten years ago, no one ever thought that computer programming would become a white collar assembly line.

So, the exciting world of computers has come down to one thing—a lot of hard work.

Programmers never seem to get ahead.

They never get caught up.

Their job will never be finished.

There's always more to do.

Sort of like working in the mill.

TELL YOUR DP MANAGER SHE JUST NEEDS TO WORK HARDER AND GUESS WHAT SHE'LL SAY.

Put a machine that does its work in milliseconds in the same room with people who are inexorably tied to the cycles of the sun and moon and seasons, and something has to give.

Inevitably, it's the people.

Frustration, anxiety and desperation build until writing an application program, essentially a creative undertaking, turns into a crank-it-out-and-shut-them-up task.

Everyone—except the computer—loses.

There's much more to be gained from making application development easier than just making it

embly Line.

faster. Taking out the drudgery, the rote, the repetition, leaves room for reflection, time for inspired daydreaming—essential activities that are at best fond memories for most programmers.

UFO, VERIFY, InterTest, IntelaGen, DataVantage, and now, most of all, CasePac help bring it back. They buy you time.

Time, we hope, not to do things faster, but to do them better.

■ *HI-TECH INTERCOURSE.*

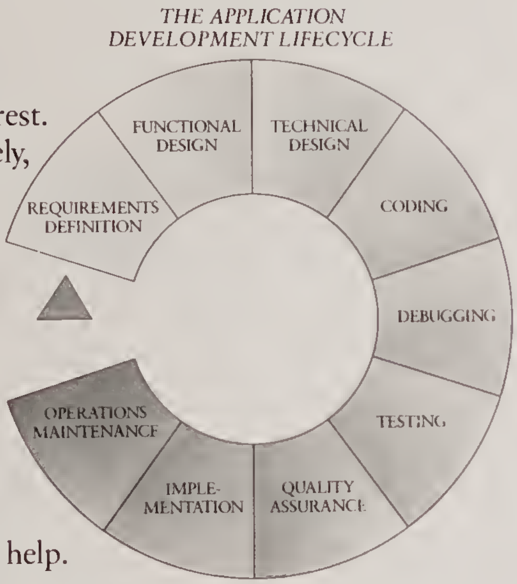
Applications programmers are much like God, or Dr. Frankenstein, depending on the outcome.

They conceive a program.
It's born.
It lives.
It grows.
It ages.
It is laid to rest.

Appropriately, the whole process is called a lifecycle.

No matter where you are in that lifecycle, from the first gleam in your eye to resurrecting a geriatric program, there's an On-Line Software product to help.

THE APPLICATION DEVELOPMENT LIFECYCLE



■ *CASEPAC.™ THE GENE POOL.*

CasePac.* Automated software development for DB2 with a powerful data dictionary.

CasePac gives you the tools to automate design and modeling functions. But most important, it stores information about your designs, models and data flow diagrams—everything it takes to build an application—in one central place where everyone can get to it. It not only stores information about current projects, it stores information about existing applications, too. So everything is consistent. Everyone works with the same definitions and standards.

Because nothing lasts forever—although some applications programs seem to—CasePac also helps you with that nasty little chore called maintenance.

Once the creator is gone—and most creator-types don't leave good notes—it falls upon the meek who have inherited the mess to figure out how it was put together and keep it going as long as possible.

With CasePac, the records are there. Records that can be used to fix what you've got. Or grow another.

CasePac. For DB2, it's where life begins.

■ *UFO.® THE BREATH OF LIFE.*

Go from prototype to finished application in record time with the most resource-efficient development system on the market. It's the most flexible, too, with full portability across CICS, CMS, TSO—even the 9370.

UFO makes it easy. Many applications can be built using menus alone, with the help of pre-programmed logic and built-in functions. For even more speed, you get automatic data base access—including DB2 and SQL—as well as an active data dictionary that makes maintenance a breeze.

■ *INTELAGEN.™ CHAIN OF COMMAND.*

Instead of writing COBOL or PL/1 code line by line, step by step, let IntelaGen do it for you.

IntelaGen generates stand-alone COBOL or PL/1 code from simple commands that cover all structured programming and computational functions.

It accepts either IntelaGen or COBOL commands, so novices can learn as they go. When they do make a mistake—and they will—an on-line syntax editor tells them right away, making IntelaGen the code generator that's easy to use even if you don't know how.

■ *INTERTEST® AND DATAVANTAGE.™ PHYSICAL FITNESS.*

InterTest is the number one CICS applications debugging and testing tool in the world.

With good reason.

It prevents all application errors known to CICS—and does it with such ease and grace, it makes one of your most grinding jobs seem a snap.

For IMS and DL/1 data bases, DataVantage automatically creates an accurate subset for testing. There's no need for manual coding since DataVantage does all the heavy labor—from query and updating to comparing data bases before and after testing.

■ *VERIFY.® RUNNING THE GAUNTLET.*

VERIFY determines if your program will wimp out when the going gets tough.

It lets you see the real impact of changes you've made to your programs *before* you get production system "surprises." VERIFY is an automated CICS quality assurance tool that handles the full gamut of testing needs. It tells you if your applications will work as expected after changes are made to your program code, CICS releases, operating systems, hardware, or transaction load.

In short, if anything changes, VERIFY can test it.

**CasePac is a joint venture with TATA CONSULTANCY SERVICES.*

How Much Trouble Wou
Unplugged Your Mainf

The Pacific…Lucky 13, a Grumman Hellcat, forces commanders and seamen alike to ponder the dilemma of a unit out of commission. (Credit: U.S. Navy Photo)

■ Yes, everyone knows that computers don't go down for a whole day anymore.

Or do they?

Would you admit it if it happened to you?

So let's forget about a day.

How about an hour?

Or, if you're an "average" MIS Department spending an "average" of over $5,000,000 a year which is an "average" of almost $100 a minute, well—you get the point.

■ OPERATIONS IS EVERYTHING. If you're willing to pay the price there are a few mainframe manufacturers who will sell you two computers instead of one, so if one goes down you've got a backup.

Sort of like carrying a spare set of batteries for your pocket calculator.

Whether or not you need fault tolerant or faultless computers, the simple fact is computers do go down.

Often. Regularly.

Usually during your prime shift, right in the middle of your business day—and these days you don't have a business day if your mainframe isn't on-line. Usually it's a programming or software problem.

Yes, we said it. Believe what you like, but there's

d You Be In If Someone rame For Just One Day?

no such thing as faultless software. Or faultless people.

There are simply no magic potions or secret formulas or revolutionary programs that will bail your rear end out at 2 a.m. when your batch programmers are fighting with CICS for a file.

There are no answers.

There is help.

■ *STABILIZE® SHELL SHOCK.*

CICS programs are born with the jitters.

STABILIZE is like pumping 25 milligrams of lidocaine into the system every time it gets jumpy.

It prevents crashes and dynamically repairs damage caused by corruption of CICS management modules and storage chains, systems or application loops, and all sorts of systems abends. And with its unique InterTest "handshake", errors won't recur.

■ *TOOLSET-DB2.™ LIBERATE YOURSELF.*

Bogged down in the really boring, repetitious parts of your job?

TOOLSET-DB2 is a complete set of tools that automates and speeds many of your routine tasks such as writing SQL statements.

With TOOLSET-DB2, you won't have to issue complex catalog queries over and over again to determine object definitions and relationships.

You won't have to do special programming to get DB2 data into a physical sequential data set—or spend long hours setting and removing DB2 security.

■ *CICS CENTRAL.™ SEE THE WORLD FROM THE COMFORT OF YOUR CHAIR.*

CICS Central is a powerful data center tool that lets you operate multiple local and remote CICS regions from one central location.

With CICS Central you can anticipate and correct CICS operational problems *before* your users notice them. All CICS and VTAM messages can be filtered, color-coded, and replied to automatically.

How's that for comfort?

■ *OMNIGUARD.® COMPUTER FRAUD? ADMIT IT! IT'S EXCITING!*

How about whoever it was that stole 16 million taxpayer records from Revenue Canada? Hah! Got even with them, didn't he? Our favorite is the disgruntled CFO who held his employer's files hostage and demanded a ransom when he didn't get an expected pay raise.

Love it! Love it! Love it!

Until it happens to you.

Then it hurts. Bad.

OMNIGUARD is the most comprehensive software security system available anywhere at any price.

Need we say more?

■ *DADS.™ WHAT HAPPENS WHEN YOU ASK YOUR MAINFRAME FOR A SIMPLE FAVOR AND IT TELLS YOU TO TAKE A HIKE?*

"Files Not Available." "Datasets In Use."

It's almost dawn. It's not funny.

You need to update your CICS files and some batch programmer has them. Who's in charge here anyway? DADS is a file and application control system for CICS/MVS that performs dynamic allocation/deallocation and automatic enabling/disabling of transactions and programs, thus allowing 24 hour CICS availability.

True, you may not need it right now.

But then again, it's not 4 a.m.

■ *VSUM.™ THREE MILLION DOLLARS FOR A MAINFRAME. FIVE MILLION FOR DISK SPACE. FILL THEM UP, THEN BUY MORE?*

Let's say you need to add 100,000 new customers.

Everything's full so where you gonna put em? Especially since all of your programmers are hiding away a little storage space "just in case they need it".

VSUM can figure out how much space you'll need, when you'll need it, and where to find it—before you're in trouble.

It saves time. It saves disk space.

It could even save the price of a new controller.

■ *FILESAVE.™ SAVE YOUR EMPLOYEES FROM A LIFE OF DRUDGERY.*

If you worked your way up through the ranks, once upon a time you probably had to recreate lost or damaged files. And you probably hadn't done the necessary backup. And you probably got into trouble.

And the same thing is probably going on in your DP department right now.

FILESAVE can keep you out of trouble by reducing your backup frequency, automating the dataset recovery process and providing fast and accurate forward and backward recovery of VSAM datasets. Most of all, it does the jobs no one else wants to do.

How to Turn Data

Location Classified...Six men from an American photo reconnaissance unit sprawl over the French landscape. (Credit: Bettmann/Black Star)

Into Information.

■ Lest we forget, all those impressive numbers, all those binary figures, all those bits and bytes and data bases that you took so much time to collect and spent so many millions of dollars to input and output and sort and store are absolutely worthless to the average branch manager in Poughkeepsie who isn't meeting his or her sales goals.

And you surely remember that meeting one's sales goals, or productivity goals or quality goals is what most businesses are all about.

Not bits.

Not bytes.

Not data.

Business is about information, and information and data are not the same.

■ *THE NEW RAMIS.®*
WHAT YOU DON'T KNOW CAN'T HURT YOU.

Converting data into information is easy, if you know how to access a mainframe and you're not already 3 months behind with all your other work.

There are alternatives.

Take the new RAMIS Information System for example.

According to Rick Holtmeier, our Executive Vice President, pulling a management report with RAMIS is so easy even his secretary learned to do it in 10 minutes.

According to Rick's secretary, it's so easy even he learned to do it in an hour so now she doesn't have to bother.

Okay, let's go back to the guy in Poughkeepsie.

He doesn't know how to access a mainframe —let's face it, you don't want him to know how to *really* access your mainframe. He doesn't know how to write a macro. He doesn't know procedural syntax from his dear Aunt Maude.

He does, however, have a commanding knowledge of the alphabet. With the RAMIS report writer that's all it takes.

For instance, if he wants to know the total revenue for each product purchased by Acme Widget in the fourth quarter of last year, he simply types—using as many or as few fingers as he chooses—Show me the total revenue for each product purchased by Acme Widget in the fourth quarter of last year.

RAMIS then displays a table listing each product and the total revenue from Acme Widget during the fourth quarter of last year. What could be simpler?

Charts and graphs could be simpler.

RAMIS does that too, with only a few additional keystrokes.

For the really inquisitive, RAMIS, RAMIS/PC Workstation™ and RAMIS English™ have pop-up menus and non-procedural syntax that provide external data selection and sequencing options, and let your man in Poughkeepsie manipulate data with summary operators, temporary fields, totals, and basic statistical operations.

It's just that easy or just that hard, depending on how you want to play it.

■ *BULLETIN.™*
WHEN IT ABSOLUTELY, POSITIVELY HAS TO BE THERE AND YOU DON'T HAVE ALL NIGHT.

Which is more unreliable, the U.S. Mail or your own internal routing service? Either way, if you haven't missed an important message in the last month, count your lucky stars. Business *is* communications, and BULLETIN lets you take charge.

With BULLETIN you can automatically send, receive, track and file everything from a hundred page business plan to a top secret dinner invitation to the hunk or hunkette across the hall. You know who has received your memos and who hasn't and who has viewed them and who didn't bother.

Getting people to act on them is a problem we haven't yet solved.

■ *OMNILINK.™*
THE GREAT COMMUNICATOR.

Anybody can make micros and mainframes talk to each other. OMNILINK lets them communicate.

If you've looked at PC to mainframe links, you've probably come away with a few questions.

Like, how do I learn all those computer languages? How do I handle security? How do I control the information flow? How do I talk to other PC users? How do I reformat data? And on and on and on.

Get OMNILINK.

Of course, we could go on and on and on.

Low Tech Solutions to

Scott Light Aircraft Ltd Dunstable
NN 511

England...High spirits and camaraderie are vital ingredients in making pilots out of men. (Credit: Reuters/Bettmann)

High Tech Problems.

Running 50 or 100 DP departments all over the world is not unlike maintaining a small army. Hardware and supplies. Logistics and communications.

And most of all, of course, people.

If you're one of the very biggest companies in the world and you need a systems integrator, you're probably going to call IBM or EDS or Arthur Andersen. And you'd probably be right to do so.

(So much for the free publicity for our competitors.)

What if you're not one of the biggest? Or, more likely, what if you need help on the departmental level?

What if you need an elite troop who can move in, assess the situation and do the job quick, without carrying around a lot of overhead?

Consider On-Line Software.

Especially if you need technical consulting.

Definitely if you're moving into DB2.

Always if you're CICS.

On-Line Software started as a technical consulting company for CICS in 1969.

Back then CICS was the really "sophisticated" end of the business and On-Line Software ruled the roost.

To some extent it still is and we still do.

But now there are a hundred companies who do it for less. Still, our old customers keep on coming back and new ones walk through the door every day.

Perhaps that's because—as we've said throughout this treatise—things are not as simple as they used to be.

Who needs just a CICS consultant anymore?

Or just a batch consultant?

Or just a DB2 programmer?

Or just a piece of software?

Nowadays, in this business, if you're just anything, you're nothing.

That's why we've expanded our consulting services, integrating them with software and supporting them with education and training so that it's sometimes hard to tell where one begins and the other stops.

However—and this is important—our consultants and educators don't sell software.

Objectivity, especially if you're a consultant, is your life's blood.

Sure, our consultants use our products whenever it serves their needs. And sure, they miss a lot of opportunities to sell a lot of software. But every person who walks through your door is given one directive: do the best job he can with allegiance to no supplier.

It costs a little business.

It keeps a lot of friends.

PLANNING A WELL RUN DP OPERATION IS LIKE REHEARSING FOR HAMLET.

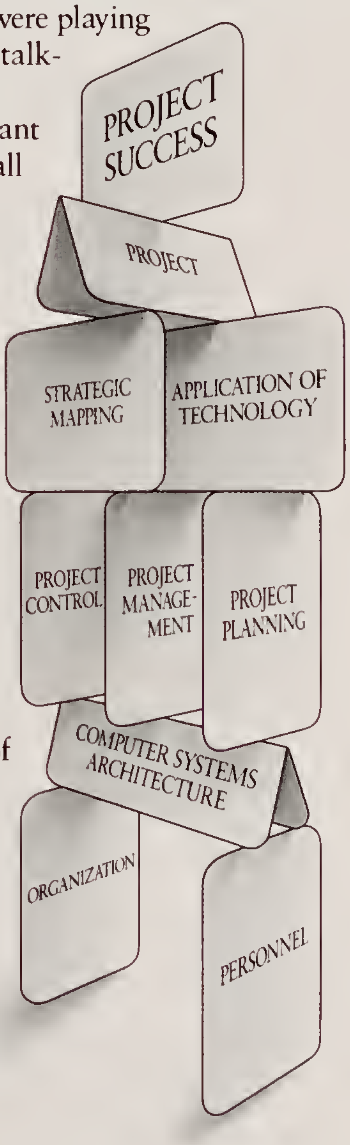
Remember your high school play? After you'd learned all your lines—or learnt if you were playing Shakespeare—the coach started talking about plot points.

Those were the important parts, the parts where most of all you couldn't mess up. If you messed up at a plot point then everything else messed up and the audience laughed. It's just the same with DP planning, only if you mess up nobody thinks it's funny. Instead of key plot points, our management consulting people call them "csf's" or critical success factors. In other words, "Those areas where things must go right for business to flourish."

Remove any block and it all falls down.

By analyzing over 150 of these csf's you can predict the chances that your project will be done on time and on budget—or done at all for that matter—before you begin.

Since, according to some industry reports, half of all projects begun are aborted before they're finished, it keeps your business from being just another crapshoot.



CRITICAL SUCCESS FACTORS

THE SMARTER THE TROOPS THE SMARTER THE GENERALS.

No one famous said that.

But they should have.

Each year On-Line Software teaches over 13,000 students—your employees—how to write your programs and operate your systems, in 750 classes taught by 32 full time instructors at ongoing offerings in New York, Atlanta, Boston, LA, Chicago, Detroit, Denver, Hartford, Princeton, Cleveland, Washington, Houston, San Francisco, London and various cities throughout Canada and Europe.

If you're somewhere we're not, we'll come to you.

Asked to brag a bit, John Morbach, Senior Vice President of Education, says, "You name 'em, we've trained 98% of 'em."

We train IBM.

We train EDS.

We train McDonnell Douglas.

We've surely trained someone in your own shop.

We offer classes in everything from applications programming to systems internals.

Our most popular courses are CICS Internals and CICS Command Level.

Our hardest class is VTAM, so hard in fact that when we discovered even VTAM professionals were having trouble we softened up and started "Introduction to VTAM".

If DB2 is in your future, we have four classes covering concepts, design, applications programming and systems, and we have them now.

In most cases, the instructors are the same people who developed the class, so students are never stuck with a teacher and a book and little else to go on.

Of course, all products, especially On-Line Software products, are always taught on the latest releases.

WHAT DO YOU DO WITH AN EXTRA $3 BILLION AND NOWHERE TO PUT IT?

Here's the lowdown.

Pennzoil had an extra three billion, cash money. (We won't mention where they got it.)

They needed to get it from New York to Dallas, Fed to Fed.

A number of banks wired the money to Manny Hanny.

Manny Hanny wired it to the Fed in NYC.

NYC wired it to Dallas.

The whole thing came down in less than 12 minutes.

It was the largest transaction in the history of the world.

On-Line Software consultants helped build the systems that did it.

And nobody lost a dime.

"WE TRAIN OUR PEOPLE TO BE NICE EVEN WHEN YOU'RE NOT."

Debbie Gregory, Assistant Vice President of Marketing Services

You just can't blame it on the computer anymore, can you?

Even if it's true, people, especially your customers, just don't go for it.

They rant.

They rave.

They scream.

They shout.

They curse your name and hang up and take their business elsewhere, if they can.

So what do you do?

You call us.

You rant.

You rave.

You scream.

You shout.

And you take your business elsewhere if you can.

We understand. And we try to do something about it.

Like having a hot line for all of our products.

Like connecting you with a technician right away.

Like getting you a new tape overnight.

Like answering a bookkeeping question the same day.

Like putting you directly in touch with the vice president in charge.

If that's not enough, call me.

Debra Gregory

IBM is a registered trademark of International Business Machines.
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D-Day.

■ It's not over.

Not yet.

And if you believe the newspapers, the magazines, the trade press, it's about to start all over again.

There's a guy in California with a goatee, a Hawaiian shirt and patent leather shoes working on a process to produce chips more efficiently—there's always a guy in California working on a process to produce chips more efficiently—but this time the fellow says they'll be a thousand times easier to make and ten thousand times more powerful.

The experts say he knows what he's talking about.

He expects to be on the market in 1993.

IBM is in on it. So is everybody who is anybody in the mainframe business.

So, it's not over.

The explosion of growth and innovation and technology that created the PC market and taught the whole world how to process data is about to start all over again.

This time the noise may not seem as loud but the impact will certainly be felt.

This time it's going to hit mainframes.

Hard.

In their corporate message, Big Blue asks you to look at the bigger picture.

We respectfully suggest you be a part of it. A part of a marriage, a partnership, a relationship–a strategic alliance intended to join you not only with IBM but with the systems software it takes to make the whole thing run.

There is no answer. Only help.

Help starts here.

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Mixed PC-Mac LANs seen as strong trend

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — Riding high on the crest of the local-area networking wave is the current trend toward mixed environments — specifically, melding IBM Personal Computers and Apple Computer, Inc. Macintoshes over one topology.

Users want to have their cake and eat it, too. They want a choice in workstations, but they also want to be able to share printers and access a common network, according to "The PC/Macintosh LAN Forecast," a recent study by Infonetics, Inc., a market research firm based here.

Infonetics is projecting that nearly one million LANs (PC, Mac and mixed) will be shipped in 1991, creating a total installed base of 2.5 million for all microcomputer LANs, said Joe Seidler, an Infonetics vice-president.

In 1991, mixed LANs, including an average of 40% Macintoshes, will account for about 25% of the total LANs shipped, Seidler predicted.

Meanwhile, the proliferation of PC and Mac LANs in that marketplace has created a major segment totaling about $1.5 billion in user purchases worldwide. The Mac's rapid penetration into traditional IBM environments is fueling the demand in this segment.

The clamor for mixed LANs turns up in the exact same places where Macintoshes excel: wherever graphical output is important, Seidler said.

Also, one mixed LAN is cheaper than two separate LANs, he added.

The rush to support Apple's Appletalk File Protocols by software developers and third-party network vendors is also expected to boost user demands.

Users in mixed environments are especially eager to have a common mail package allowing them to exchange messages between Macintoshes and PCs "without thinking about it." Another high priority is the ability to exchange data between applications anchored in the two environments. There are not enough vendors who provide this, Seidler said. Network management across both areas will also become important.

In mixed-LAN environments, the emerging major vendors are Sun Microsystems, Inc.'s Tops division, 3Com Corp., Apple and Novell, Inc. In the PC-only LAN segment, the dominant vendors are Novell, IBM and 3Com; on the flip side, leading vendors in the Mac-only LAN niche include Tops and Apple, the study said.

These companies are listed in the order of market share.

> INFONETICS is projecting that nearly one million LANs will be shipped in 1991.

Stress

CONTINUED FROM PAGE 77

terworld readership surveys finger the following as the major culprits: keeping up with technology, managing equipment, user demands and budgetary constraints.

Other causes

An informal survey of CMA and non-CMA members adds these contributors: organizational restructuring, such as joint management of voice and data systems; mergers and acquisitions, which can result in layoffs; information overload; and an ever-increasing duty roster.

Not surprisingly, many telecommunications managers feel powerless, being pulled as they are in so many different directions. As a result, many do not handle stress effectively, the magazine claimed.

It is important that managers learn to cope successfully with stress; otherwise, they will also be saddled with any or all of what CMA perceives as the seven most common effects of excessive stress:

- **Decreased productivity.** Staffers begin missing deadlines.
- **Negativity.** Employees spend more time complaining than working.
- **Decreased communications.** People tend to communicate less when they are under stress.
- **High turnover.** This can prove costly, given the need to hire and train replacements.

Other effects include excessive daydreaming, chronic absenteeism and frequent illness.

Always remember this

The closest CMA comes to providing a golden rule for handling stress is to suggest that "control reduces stress."

The magazine recommends that managers first identify the cause of their stress. The next step is to devise a strategy to better shield themselves from the negative aspects of stress while addressing the problem, thereby increasing their potential to alleviate the pressure.

More detailed techniques for identifying stress on the job and methods for controlling its impact will be addressed in future issues of the magazine.

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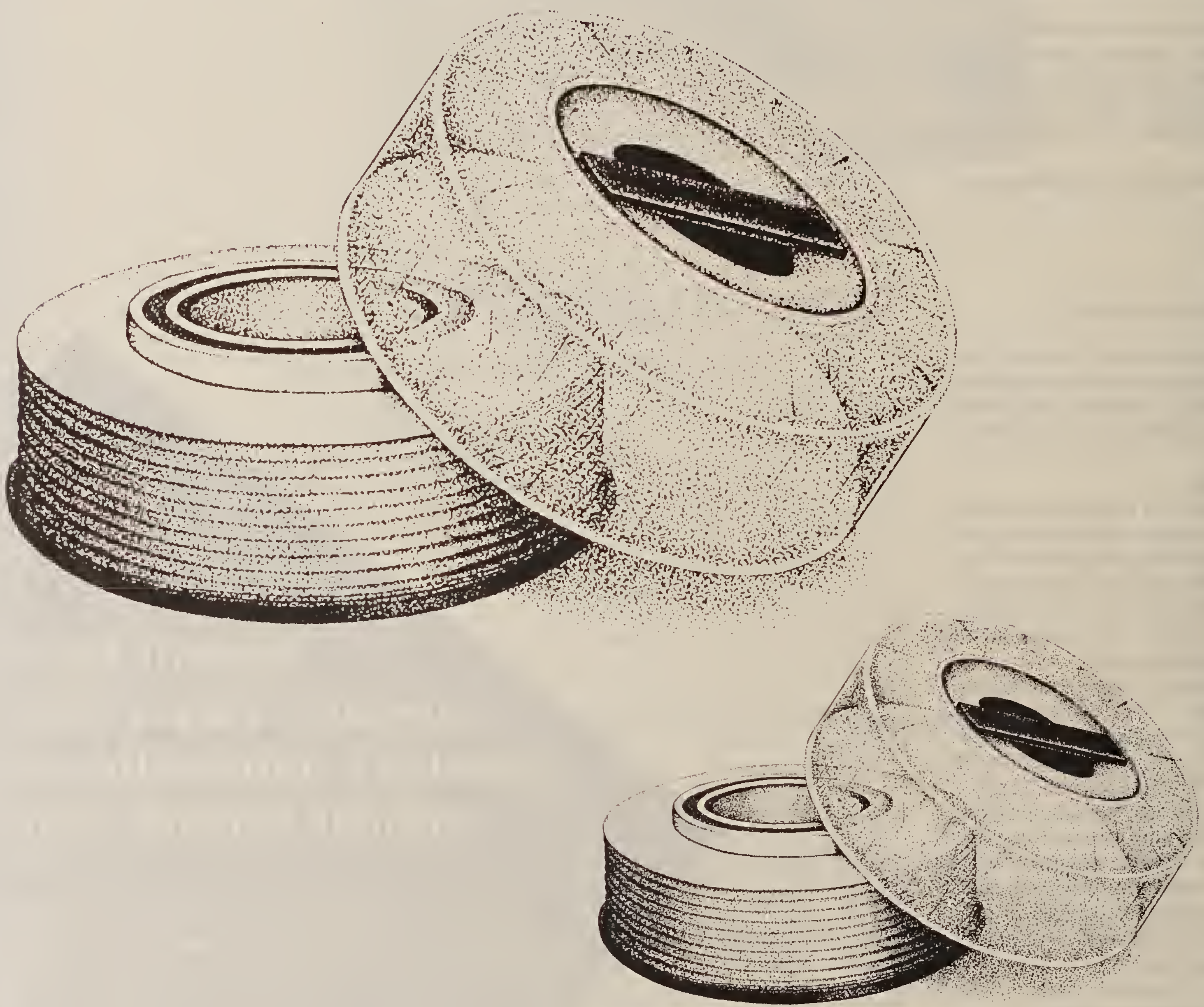

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Leong

CONTINUED FROM PAGE 77

based local-area networks.

Some of these offerings are worth taking a look at. If you buy the marketing hype from the telephone companies, you will find you can be spared the hassle of managing your own LAN, for example.

Most of them now offer, or plan to offer, central office local-area networks — networks that support 1M bit/sec. data and voice over the local telephone connection. The hub of this particular network is based at the telephone company, so there's no muss, no fuss. Users pay a service and installation fee; the rest is taken care of. But here's the downside:

- What if you need additional features and the phone company cannot release them because they haven't been cleared by the local public utilities commission?
- What if there is a big glitch in the network and you desperately need a repair person right away because no one in your company is qualified to look into the problem?
- What if you change location and are locked into the contract until 1999?

For now, the number of central office LAN users is small, but it is a satisfied group. The various phone companies are pricing their services differently and, for now, are very flexible with users because they'll do just about anything to build a dedicated following.

Electronic mail services from the phone companies are also expected to come out soon. Pacific Bell and Digital Equipment Corp. recently said they have begun CCITT X.400 testing at select customer sites. Santa Clara University's 650 students and faculty will be communicating via X.400 using DEC software and hardware along Pacific Bell transmission lines. If all goes well, they will offer these services by next summer.

Those who use E-mail love it. Now the question is, who will want to buy it from a telephone company if there are other vendors already offering it on a national basis?

The phone companies cannot offer services outside their territories. That means Pacific Bell is limited to offering E-mail to firms within the state. But if Pacific Bell makes the price very attractive, MIS should consider what it has to offer. The same goes for services such as X.25 packet switching.

Bell Atlantic recently signed a sweet deal with Telenet to connect their public packet-switched networks together. Bell Atlantic has nodes serving customers from New Jersey to Pennsylvania to Washington, D.C. Telenet has switching locations nationwide. This was a smart investment for both companies, for their users now have access to additional cities.

The shrewd MIS manager should take a peek at the latest phone company catalog of services. Going with one for certain services can be an asset when faced with limited in-house resources. Using an E-mail service temporarily could prove to be a good short-term solution if there is a need to communicate with an employee located only several miles away.

Indeed, old Ma Bell ain't what she used to be.

Leong is *Computerworld*'s West Coast bureau chief.

Some tech stocks reap financial rewards despite Wall Street jitters

Wall Street may have a bad case of the heebie-jeebies when it comes to technology stocks these days, as evidenced by the recent drubbing of Digital Communications Associates, Inc.'s stock, but that hasn't stopped a number of communications vendors from harvesting significant investment gains.

Newport, R.I.-based Avanti Communications Corp. recently secured approximately $9.8 million in additional financing to support future growth plans. The monies were secured via the private placement of convertible preferred securities.

The T1 maker's 1988 revenue is expected to near $30 million dollars, with an overall growth rate of 50%, according to company President Tom Taylor.

Last month, systems integrator Jupiter Technology, Inc. in Waltham, Mass., garnered $3.6 million in a private placement of equity capital. The additional funding will be used to increase the firm's national and international sales and marketing efforts.

Jupiter introduced a family of data communications computers that reportedly combine a proprietary communications operating system and modular software with expandable multiprocessing hardware.

And despite the fuss raised over certain statements concerning the emerging standard for running high-speed Ethernet over telephone cable, Synoptics Communications, Inc. said it was able to realize a minimum of $13.50 per share in its initial public offering. Originally, the firm had sought $11 to $13.50 per share, but there are some reports that it was getting $15 per share.

Of the 1.5 million shares for sale, one million were offered by the company and 500,000 were offered by the selling security holders.

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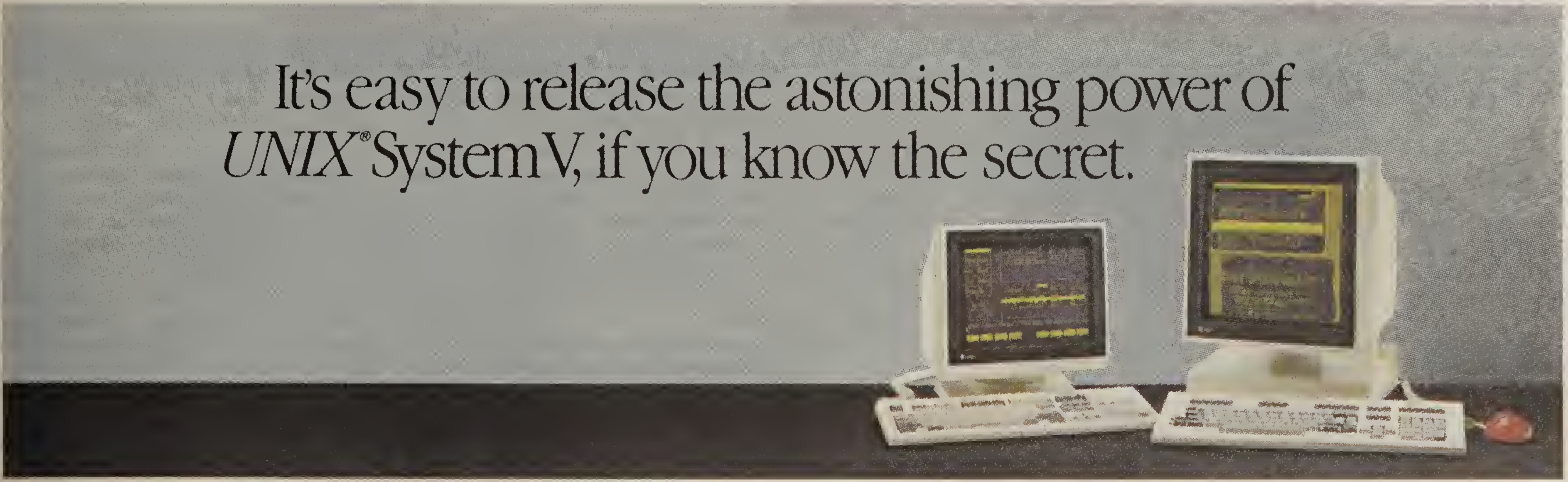

AT&T 605 BCT terminal (left) shown with AT&T PMX/TERM menu. AT&T 630 MTG terminal (right) displays text editing on two hosts, simultaneously.

The secret is the AT&T 600 Series Display Terminal family.

If you've ever been forced to live with two CRTs on your desk just to get the information you need, or have struggled to connect your terminal to a second computer, you'll appreciate the power and simplicity of the AT&T 600 Series Terminals—the first terminals that take full advantage of the UNIX® operating system invented by AT&T.

AT&T 620 MTG terminal (left) supports common business graphics interfaces. AT&T 615 MT (right) is the recommended multitasking UNIX System Administration terminal.

AT&T's windowing technology, built into the 600 Series, provides a seamless link to UNIX System V's multitasking capability and gives the terminals unprecedented windowing power. The result is that one 600 Series Terminal can do the work of several ordinary ones, saving you time, money and space, and improving productivity.

Now you can send data back and forth among PCs, minicomputers, and mainframes in just seconds. You can use the powerful multihost, multitasking windowing system built into the 600 Series Terminals to preview data from up to seven different sources, both local and remote, at the same time. You can run multiple live applications concurrently.

> *AT&T's terminals allow you to display up to seven windows simultaneously, putting the world truly at your fingertips.*

Each window behaves as if it were a stand-alone terminal with its own host connection, and up to seven windows can be displayed per host. Plus you get full bit-mapped graphics, local processing, and a large, easy-to-read screen.

Total UNIX System compatibility.

Most importantly, the windowing and other advanced features of the 600 Series Terminals work instantly with your system software; there's also no need to modify existing applications software. And the 600 Series works seamlessly with AT&T's powerful 6386 WorkGroup System and 3B Computer products.

AT&T 630 MTG terminal: Provides dual-host access and down-loadable applications (left); provides high resolution display of engineering or business graphics (right).

In addition, the AT&T 600 Series Terminals offer full PC terminal capability in the UNIX System environment so you can unleash the power of both UNIX System V and MS-DOS* applications for your remote terminal users.

Whether you're a small business using PCs for order entry and inventory control, or a large company with multiple databases for telemarketing, credit reporting and customer account histories, the 600 Series Terminals from AT&T can help improve your productivity. You can also run a variety of general office applications: word processing, electronic mail and spreadsheets.

The 600 Series is the premier general purpose and software development terminal series for programmers. Since each window is simultaneously active, you can concurrently edit, compile, and debug the same program in separate windows.

To get more information or take a closer look at these terminals, contact your AT&T Account Executive, Authorized AT&T Reseller or call 1 800 247-1212, Ext. 879.

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Local-area networking hardware

A series of disk subsystems designed to give Novell, Inc. Netware 2.1 users larger disk capacity for network performance has been announced by **CFN Industries.**

The **CFN-8600** series reportedly offers disk data transfer rates of up to 2.45M byte/sec. and access times as low as 15 msec. Disks are available in 374M-, 510M-, 689M- and 840M-byte storage configurations.

When used in conjunction with the CFN 8600 controller, Novell users may connect up to four drives in a daisy chain topology to achieve a storage capacity of 3,300M bytes, the vendor said.

The 689M-byte disk configuration costs $8,900; the 840M-byte version costs $9,900. Additional pricing information may be obtained from the vendor.

CFN Industries, 30-A Lindbergh Ave., Livermore, Calif. 94550. 415-443-1672.

A hardware platform that reportedly will transform most Intel Corp. 80286- and 80386-based microcomputers into a multiuser system server, network master node or engineering workstation has been announced by **Redline Computers, Inc.**

Called **Data Cell,** the product is configured as a caster-wheeled tower unit that incorporates an uninterruptible power supply, extra drive bays, data switches and a filtered power supply. The 80286 or 80386 CPUs with standard IBM Personal Computer AT-size cases can be installed vertically into Data Cell, which allows users to condense computer space and increase power.

According to the vendor, the product is targeted for 80386-based computer-aided design and engineering workstations, multiuser system servers and master node network file servers.

The product will initially be offered through Redline's dealer-direct and value-added reseller programs.

Redline Computers, 7924 Miramar Road, San Diego, Calif. 92126. 619-566-3883.

Local-area networking software

Aker Corp. has announced **Magic LAN,** a local-area network, rapid database application design product intended for professional developers.

The multiuser system is said to operate on all LANs that support the generic DOS 3.0 protocol, including Novell, Inc.'s Netware, 3Com Corp. and the IBM Token-Ring. The product provides automatic sharing of data files among multiple users with file and record locking. Security features include passwords, user identifications and authorization levels that may be assigned by the system developer.

Magic LAN costs $399.

Aker, 18007 Skypark Circle, B2, Irvine, Calif. 92714. 714-250-1718.

Laguna Laboratories, Inc. has introduced **Hands Off,** a software package designed to automate data transfer between the IBM System/36 and 38 series of minicomputers and stand-alone or networked microcomputers.

The product reportedly supports bidirectional file transfers and allows users to schedule jobs at optimum hours. The package also allows automatic IBM System/36 or 38 sign-on and sign-off functions as well as automatic command and data entry. The product is compatible with all IBM 5251 emulation boards and includes necessary technical support.

Hands Off costs $250.

Laguna Laboratories, 1300 Normandy Place, Santa Ana, Calif. 92705. 714-835-9100.

Network management

Cincom Systems, Inc. has announced the general release of **Info/Master,** a Net/Master Version 2.0 facility. The addition will allow users to quickly and easily develop applications to support computer and network operations, the vendor said.

Info/Master consists of a reusable Network Control Language code for building application logic and a database repository for storing system- and network-related data.

Along with Net/Master's network security, session manager, file transfer, session monitor and other components, the 2.0 facility can reportedly coexist with Netview's Network Communications Control Facilities and other Communication Network Management products.

Info/Master costs from $15,000 to $25,000, depending on operating system and CPU group.

Cincom Systems, 2300 Montana Ave., Cincinnati, Ohio 45211. 800-543-3010.

Connect Computer Co. has begun shipping **Version 2.1** of its **Lanscope** local-area network management software system for Novell, Inc., 3Com Corp., IBM and Banyan Systems, Inc. networks.

According to the vendor, the product enhances user menuing, security, usage tracking, software-usage control, network resource management and print spooling capabilities. The latest release also offers support for user-defined constants such as Network Interface Card and increased support for three-part naming. The product is available with four add-on modules.

Lanscope products are priced from $99 per server.

Connect Computer, Suite 270, 9855 W. 78th St., Eden Prairie, Minn. 55344. 612-944-0181.

Links

Eicon Technology Corp. has introduced several bridge products for connecting IBM Netbios-compatible local-area networks and personal computers over switched lines and CCITT X.25 packet-switched networks.

The **Netbios Remote Bridge** reportedly connects two Netbios LANs over a synchronous, port-to-port line to provide as many as 128 concurrent sessions. The product consists of a proprietary adapter card for IBM Personal Computers or Personal System/2s and software. The Netbios Remote Bridge costs $1,995.

The **Netbios Bridge/X.25** is an option to the LAN II Configuration of Eicon's Access/X.25 and Access/QLLCD. It is said to support up to 128 sessions connected to multiple LANs over

Or VAX,

Or Both,

X.25 packet-switched networks. The Netbios Bridge/X.25 costs $1,400.

The **Netbios Remote PC/X.25** is a software option to the stand-alone and LAN configurations of Access/X.25 and Access/QLLC. The stand-alone product will reportedly support six sessions to connect remote PCs to Netbios LANs over X.25 networks. The LAN version is said to support up to 16 sessions, connecting PCs on a remote LAN to another Netbios LAN. The stand-alone version costs $100; the LAN version costs $400.

All three products reportedly support data speeds up to 64K bit/sec.

Eicon Technology, 2196 32nd Ave., Montreal, Canada H8T 2H7. 514-631-2592.

Cisco Systems, Inc., a manufacturer of intelligent gateways and servers for local- and wide-area networks, has announced a gateway interface that reportedly allows companies to create a CCITT X.25 backbone network operating at T1 speeds.

The **X.25 board** is said to have a throughput maximum of 4M bit/sec. and plugs into a slot in the backplane of Cisco's gateways. The interface board also supports the Department of Defense Network X.25 specifications.

The Cisco X.25 board costs $1,750 per T1 port plus the cost of X.25 software.

Cisco Systems, 1360 Willow Road, Menlo Park, Calif. 94025. 415-326-1941.

Commtex, Inc. is now shipping its **CX-25 NPSI PAD.** The packet assembler/disassembler (PAD) was designed to act as a gateway between the CX-80 Data Exchange — or other Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) cluster controllers — and a CCITT X.25 packet-switching data network.

The CX-25 reportedly converts IBM SNA/SDLC data streams into a form that is transportable over an X.25 network and supports both QLLC and PSH protocols. The product has one SDLC port and one X.25 network connection, and both ports are standard RS-232.

The end-user price for the CX-25 NPSI PAD is $2,750.

Commtex, 1655 Crofton Blvd., Crofton, Md. 21114. 301-721-3666.

Itron, a division of Infotron Systems Corp., has introduced **LAN Span**, a remote local-area network bridge.

The bridge is said to remotely connect Ethernet 802.3 LANs over high-speed synchronous circuits. The product is protocol-transparent, thereby allowing all attached stations to communicate over the same wide-area circuit.

LAN Span support includes V.35, RS-449, T1, and CCITT links at speeds from 56K bit/sec. to 2.048M bit/sec. According to Itron, the product offers vendor independence on both the LAN side and wide-area side of the communication facility.

LAN Span costs $11,500.

Itron, Suite 116, 130 Gaither Drive, Mt. Laurel, N.J. 08054. 800-423-8044.

Wang Laboratories, Inc. has unveiled a communications controller that provides a direct connection of third-party Tempest devices to Wang's Tempest VS minicomputers.

Tempest Wang Asynchronous Communications Subsystem, or WACS-T, reportedly connects any terminal that conforms to ANSI X3.64 standards to Wang's VS 5T, VS 6T, VS 65T, VS75E-T and VS 85T processors.

The controller gives users on the non-Wang terminals access to all VS integrated information processing services, including Wang WP and WP Plus, Wang Office, the Pace database management system and other data processing and communications applications.

A 16-port WACS-T costs $16,000; a 32-port unit costs $25,000.

Wang Laboratories, One Industrial Ave., Lowell, Mass. 01851. 508-459-5000.

Crystal Point, Inc., a manufacturer of asynchronous communications products for the IBM Personal Computer local-area network market, has announced a gateway program for Ungermann-Bass, Inc.- and IBM Netbios-compatible networks.

Called **Linelock**, the program provides dial-back access, idle-line monitoring and control of outbound calls, the vendor claimed. Linelock consists of two major components: the asynchronous gateway portion, which is written in assembly language; and the security and accounting portion, which is written and compiled in Ashton-Tate Corp.'s Dbase III code. The security and accounting functions can be modified to generate custom reports and billing modules.

An 8-port version of Linelock costs $2,495; a 16-port configuration is priced at $3,995. The Dbase III code for program modification is available for an additional $800.

Crystal Point, Suite 202, 12707 120th Ave. N.E., Kirkland, Wash. 98034. 206-821-1909.

Modems/Multiplexers

A 14.4K bit/sec. leased-line CCITT V.33 full-duplex modem has been announced by **Emulex Corp.**

The Perfomance 1000 Dial Backup modem is said to be capable of automatically establishing a temporary dial-line connection when the primary leased-line connection fails.

The product uses trellis-coded modulation and includes clock/calendar and reconnect features. The modem is also available in 9.6K bit/sec. V.29-compatible versions.

Emulex's Performance 1000 Dial Backup modem is priced from $1,195 to $1,995.

Emulex, P.O. Box 6725, Costa Mesa, Calif. 92626. 714-662-5600.

Racal-Milgo Information Systems, Inc. has lowered the prices of its **Omnimux 8000 Series** of T1 multiplexers.

The company is offering the low-end 12-channel multiplexers for $10,000. Fully redundant 36-channel systems will be priced less than $20,000. The Omnimux line features integrated support of voice, data and compressed video and offers individual module tests or loop-back conditions.

According to the vendor, report generation, alarm mapping and reporting functions and password protection are also included.

Racal-Milgo Information Systems, 1600 Summer St., 5th Floor, Stamford, Conn. 06905. 203-358-0540.

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IN DEPTH

Unix vs. SAA

Use by use, Unix may make more sense for commercial environments

BY GEORGE SCHUSSEL

LARS JUSTINEN

Some things are worth waiting for. But IBM's Systems Application Architecture may not be one of them.

SAA, IBM's grand scheme for building a set of standards that will allow portability of applications across its several incompatible architectures, will not be delivered for at least five to 10 years.

And many industry analysts say they doubt that SAA — probably the single most ambitious software project attempted to date — will ever be completely delivered.

Further, the principal benefits of SAA — application portability and environment independence — can already be achieved by using the Unix operating system. A 90% applications portability level is currently available in the Unix world, while a comparable capability is only promised for SAA across three major IBM platforms — and only by the early 1990s.

Don't get no respect

Despite such portability, Unix naysayers have continually dismissed the operating system, pointing to the notion that its engineering and scientific bent is problematic for commercial uses. That situation is about to change.

One measure of the change is the market standing for Unix. According to a 1988 forecast by Framingham, Mass.-based International Data Corp. (IDC), by 1991 the worldwide value of computer systems shipped for Unix will slightly exceed the value of all IBM's 370 architecture shipments (see chart page 103). As an example, consider that the number of worldwide Unix licenses shipped in 1986 was 350,000; this total almost doubled to 600,000 by 1987.

On the heels of its market surge, some important advantages will accrue to commercial users of Unix. They include the following:

- Applications designed for Unix will be able to run on the widest selection of hardware.

SAA, if delivered as promised, will provide applications portability across IBM's Application System/400, Personal System/2 and 370 architectures. Unix, however, will also run on these IBM configurations.

In addition, Unix is currently available on Intel Corp. 80386 personal computers, almost all minicomputers and most mainframes. And, either now or in the near future, Unix should be available on most supercomputers.

By 1990, Unix will have become the only operating system in the history of computers that runs on almost all product lines being sold, regardless of size or cost.

- Unix will be the operating system of choice for the highest technology hardware.

Most leading supercomputer and minisupercomputer manufacturers — ETA Systems, Inc., Cray Research, Inc., Convex Computer Corp., Alliant Computer Systems Corp., Fujitsu Microsystems of America, Inc. and so on — expect Unix to become the dominant operating system requested by their users in the future.

The most exciting developments in the hardware arena are currently occurring in the world of reduced instruction set computing (RISC). Unix is the universal operating system supplied by vendors of RISC hardware.

While complex instruction set computers like Digital Equipment Corp.'s VAX and the 370 require from five to 10 machine-memory cycles per native instruction, RISC machines generally operate at between one and two memory cycles per instruction.

RISC microprocessors are forecast to be available in a price range of $1,000 per million instructions per second (MIPS) by 1989 or 1990.

Vendors of these technologies — Mips Computer Systems, Inc., Sun Microsystems, Inc., Motorola, Inc., Intel, VLSI Technology, Inc. and Hewlett-Packard Co. — will be delivering machines during the next couple of years with the 30- to 50-MIPS processing power of large IBM

Schussel is president of Digital Consulting, Inc. in Andover, Mass.

……

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Unix tradeoffs

SAA — SNA		Unix — OSI*
• Applications isolated from operating system	⇔	• Operating system independent of hardware
• C replaces assembler as performance tool	⇔	• C is the performance language
• Supports older applications	⇔	• Must convert to Unix
• IBM hardware only	⇔	• Runs everywhere
• IBM and Microsoft's Presentation Manager	⇔	• Open Look, X-Windows and Presentation Manager
• Mature - security, integrity, filing options	⇔	• Immature - security, filing, scheduling, utilities
• SAA - standards for application development	⇔	• Common Application Environment and X/Open - Unix System V, Posix, OSI, SQL
• Batch operating system and transaction processing	⇔	• Time-sharing operating system not optimized for transaction processing, single-user multitasking

*The ISO Open Systems Interconnect

SOURCE: DIGITAL CONSULTING, INC.
CW CHART

3090 mainframes at a cost of $50,000 for the CPU.

IBM 3090-class mainframes currently cost approximately $100,000 per MIPS. With the advent of the Summit series, expected to be released around 1990, this price may drop, although it is unlikely it will go below $50,000 per MIPS.

This means that a user who wishes to take advantage of RISC hardware with costs that are only 2% of those on mainframes should be building applications for Unix, which is the de facto standard in the RISC world.

• Unix implementations are much less expensive hardware-wise than proprietary solutions.

This point is easily shown by pricing configurations from various manufacturers. For instance, a typical 12-user minicomputer system from IBM or DEC can easily run up to $80,000. Comparable performance is available from a 386 PC with terminals and multiuser Unix. The Unix configuration will cost $15,000 to $20,000.

When hardware cost is a significant consideration, there is strong reason to seriously consider Unix.

• Applications portability will be greatest under Unix.

For IBM's customers, SAA is promised as the solution to applications portability. You can upgrade your hardware environment without having to rewrite your application.

Within the next five years, however, SAA portability will only be provided across three IBM platforms — 370-MVS and 370-MV, PS/2-DOS and PS/2-OS/2 and System/36 — and even across these platforms, full portability is highly questionable. For example, CICS code will not run on PS/2s.

It is certainly true that there are many different implementations of Unix today, and migration from one to another requires some conversion. This level of effort, however, is still much less than is required in moving across the different SAA hardware platforms currently available.

Within the next year, AT&T's Unix System V will provide a unifying platform that absorbs the University of California at Berkeley's Unix 4.2, Xenix and Unix. As the Open Software Foundation (OSF) begins delivery of its AIX-based Unix in the 1990 time frame, both the OSF and AT&T versions will likely become similar.

> A USER who wishes to take advantage of RISC hardware with costs that are only 2% of those on mainframes should be building applications for Unix.

This similarity will be driven by standards defined by the National Bureau of Standards, recently renamed the National Institute of Standards and Technology, and the American National Standards Insitute and demanded in U.S. government procurements (see story page 104).

• Unix offers a friendlier user interface.

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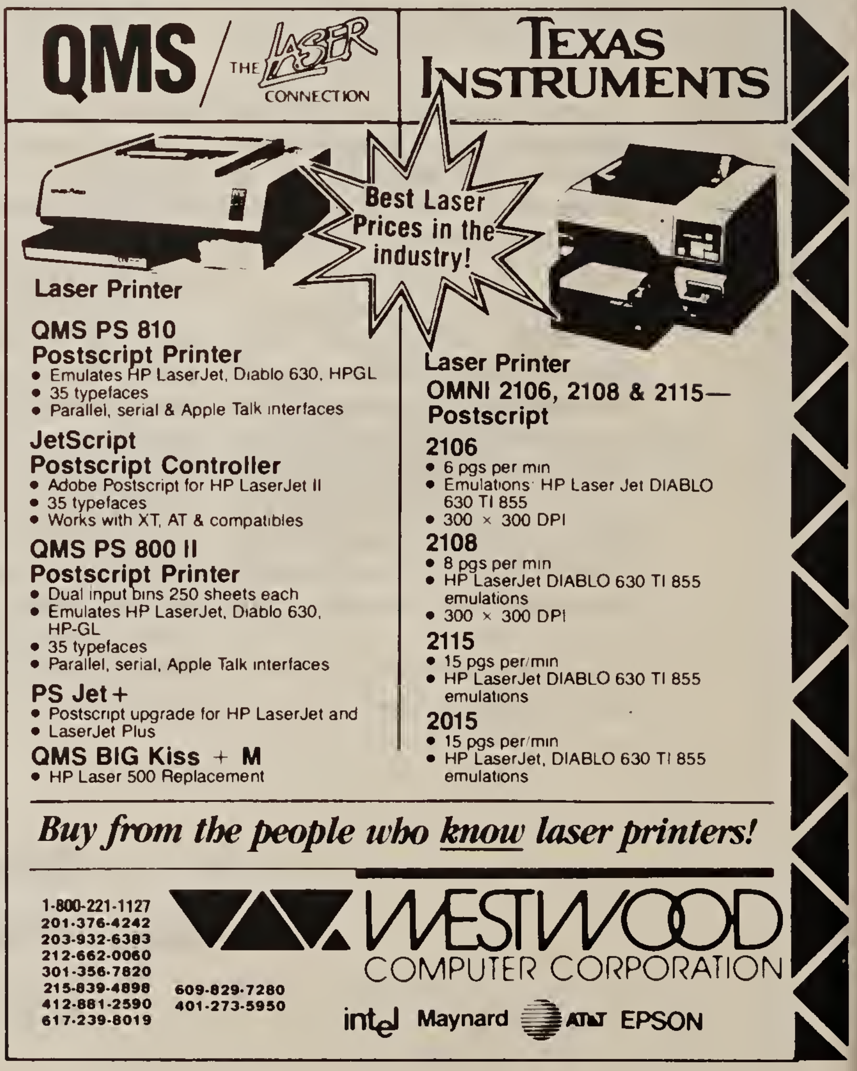
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command-level interface of Unix, which by today's standards can be called "ugly."

If this were the only way possible to use Unix, its widespread acceptance would be seriously in doubt.

However, the Unix world can expect several Apple Computer, Inc. Macintosh-like shells to emerge as accepted standards.

For example, Sun's Open Look interface is being distributed by AT&T. And X Windows is also currently available and has received good reviews.

And since Microsoft Corp. has joined the OSF, it is likely that OSF's Unix will feature a Presentation Manager shell. These icon-based interfaces will make a significant difference in the level of accessibility to the operating system and its utilities.

> THE principal benefits of SAA — application portability and environment independence — can already be achieved by using the Unix operating system.

A comparable shell functionality in SAA will be provided by the IBM and Microsoft Presentation Manager. While Presentation Manager is initially available for OS/2, IBM's SAA specifies that an identical user interface will be provided on the mid-range and large-scale SAA mainframes.

The fly in the SAA ointment, of course, is the Apple lawsuit against Microsoft for "look and feel" copyright violation.

If Apple is successful, it is unlikely that IBM will continue its plan to offer a Presentation Manager-like interface for all its SAA systems.

It is doubtful that IBM would pursue an implementation that requires license fees to be paid to Apple on all IBM computers sold.

The point is not to say that IBM will be unable to provide a Macintosh-like user interface for its systems; IBM most assuredly will. The point is that the user interface may not be Presentation Manager.

The Apple suit, whether successful or not, will delay the availability of Presentation Manager in the SAA world. This means that the various icon-based graphics Unix shells are going to be widely available well before Presentation Manager or its equivalent make their debut in the SAA world.

- Unix opens the world to workstations.

Many users are anxiously awaiting the benefits promised by future versions of OS/2.

These benefits will include the ability to support large screens with intricate graphics, the power to run serious applications that include database jobs and the capability to use windows to take advantage of multitasking. But users don't have to wait for all these benefits. They are currently available on Unix workstations. The workstation market leaders — Sun, Apollo Computer, Inc., DEC and HP — are delivering powerful products that run Unix and can do today the kinds of things that one expects the PS/2 Models 70 and 80, in combination with OS/2, to be able to perform in 1990.

In addition, of course, Unix and Open Look were both designed to be multiuser, while OS/2 was designed as a single-user system. It is a reasonable guess that a future version of OS/2 will probably support multiuser capabilities.

Given, however, that OS/2 has been in development for five years and is still not in general distribution nor widely used, early deliveries of multiuser versions should not be expected.

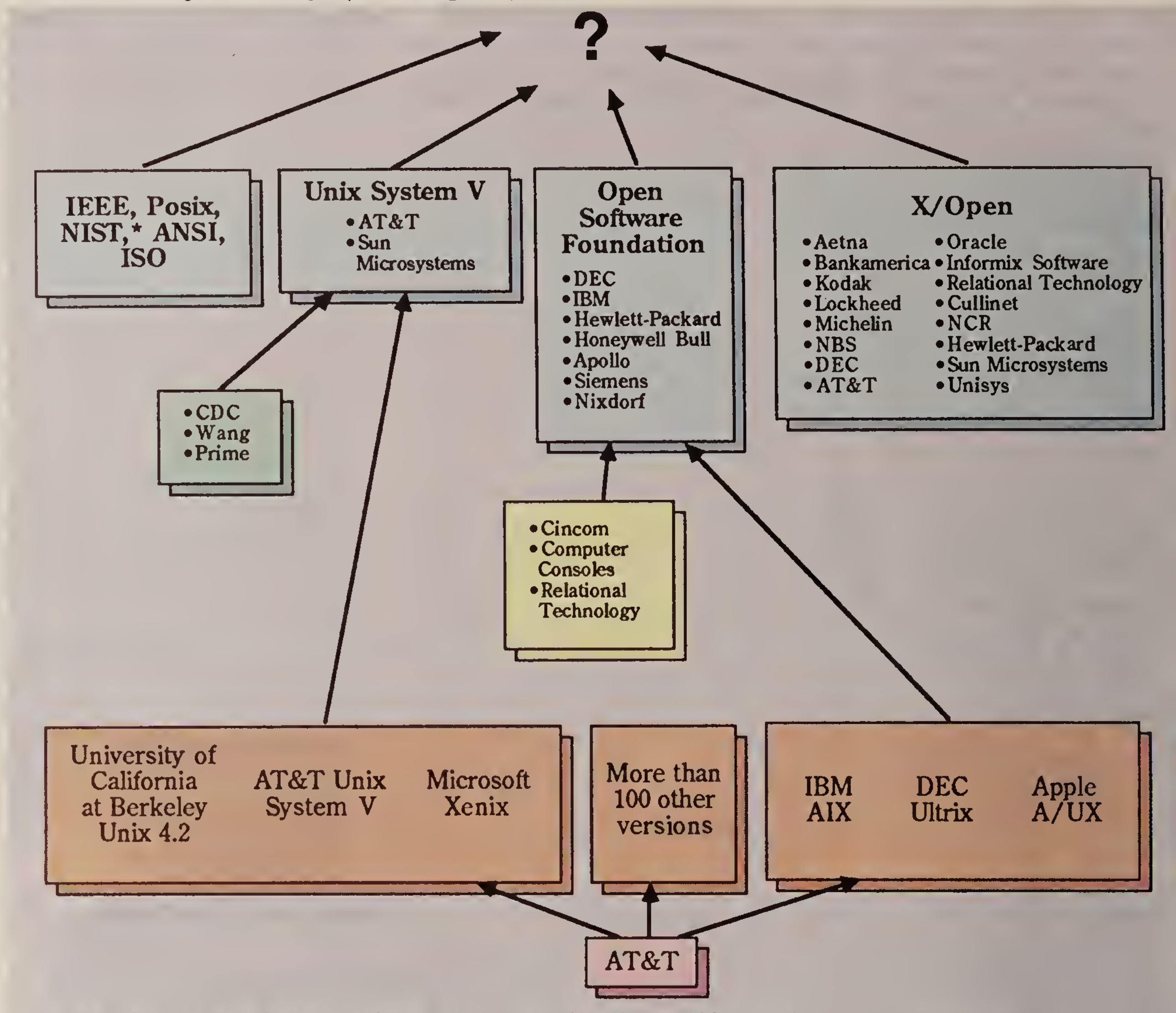
- There are many good reasons for the PC user to consider Unix.

Hardware vendors indicate that approximately one in five 386 PCs is being delivered with Unix — almost always with Xenix.

Given that a typical multiuser 386 installation has five or six terminals, the conclusion is that there are as many people sitting at 386 PCs looking at Unix as there are sitting and looking at DOS.

Although problems with OS/2

Unix: family history (and fight?)



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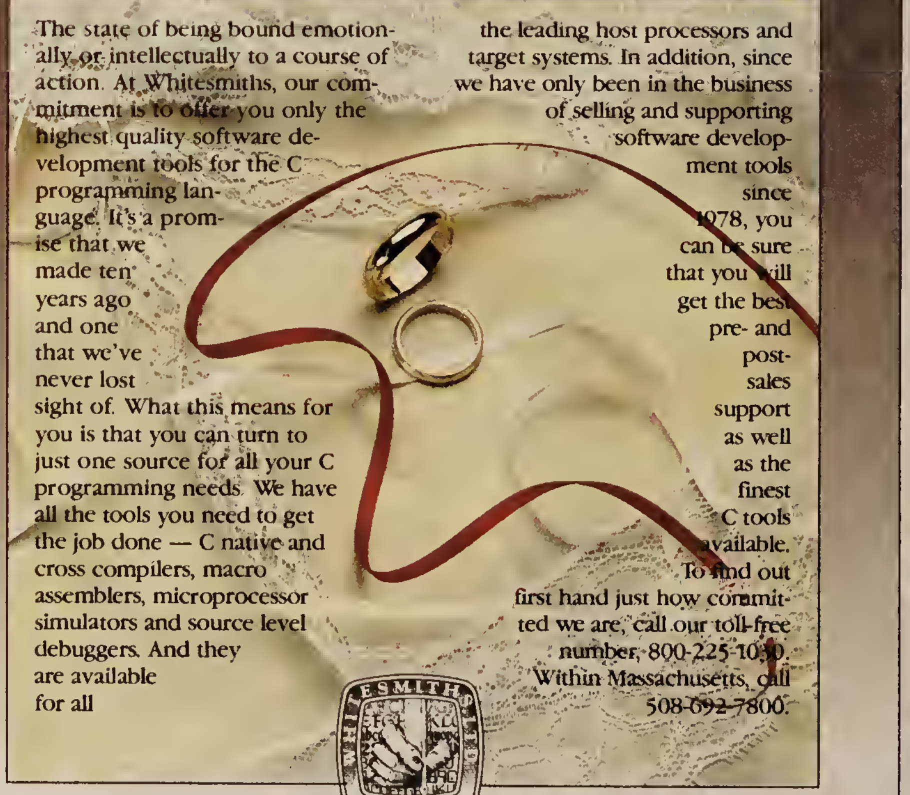

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are going to delay its acceptance as the dominant operating system for 386 PCs, there has not been much doubt that at sometime, probably in the early 1990s, OS/2 will overtake DOS as the standard operating environment for Intel microprocessor PCs.

Supply and demand

However, if there are serious delays with the delivery of working copies of OS/2, or if Apple's Presentation Manager look-and-feel lawsuit becomes successful, two years from now Unix may well have emerged as a viable alternative standard to OS/2 on 386 PCs. Some reasons for this are the following:

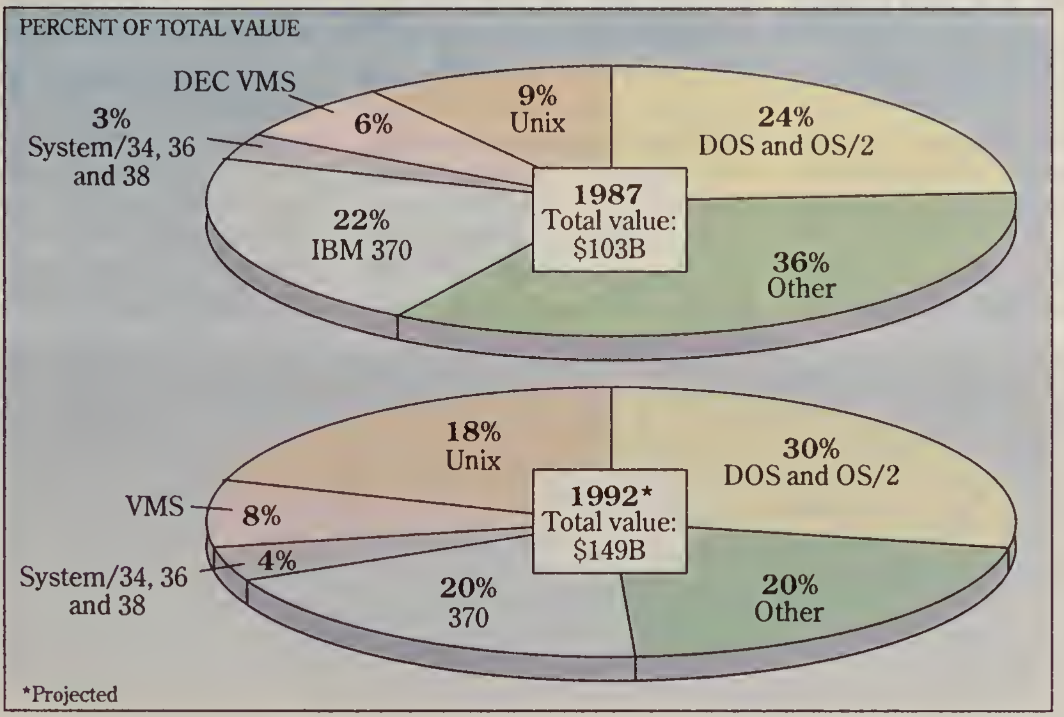
- Unix is a currently available, proven, multitasking, multiuser operating system for PCs. In fact, it is the only such operating system to be produced in this decade.
- DOS can run under Unix. DOS applications can be brought up in compatibility mode under Unix.
- Unix offers more small machines as target platforms. While OS/2 runs only with Intel microprocessors — as does Xenix — Xenix is also operational with machines supporting processors made by Motorola, National Semiconductor Corp. and others.
- Multiuser 386 Unix is an effective solution to communications-oriented applications and is an easier and more proven solution than local-area network technology.

Of course, Unix also supports local-area networks, but its ability to be implemented as a single-processor, multiuser system with terminals offers an essential option that is has been proven to be more cost-effective than OS/2 is at this point in time.

- Ashton-Tate Corp., Software AG of North America, Inc., Lotus Development Corp. and many other major software suppliers have announced their intent to port software to Unix.

According to a 1988 forecast made by IDC, the Unix share of worldwide computer systems shipments will double from 1987 to 1991 (see chart page 100). This significantly increased market share will be very attractive to software developers.

Value of worldwide computer systems shipments



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In spite of these advantages, there are drawbacks to using the Unix operating system. Two of these are as follows:

- Unix is a time-sharing operating system, analogous to IBM's MVS/TSO or VM/CMS.

Time-sharing operating systems are excellent for program development and query processing but are not particularly well suited to transaction processing or single-user multitasking.

IBM, with its variety of mainframe operating systems — primarily MVS and VM — offers different environments well suited to both the interactive development and application processing environments.

In order to represent a serious challenge to proprietary operating environments, Unix has to mature during the next few years to become more satisfactory as a transaction processor.

Some of its maturity may come from database management system vendor companies.

A good example is Relational Technology, Inc., which with its recent implementation of Ingres on parallel processing Unix machines has converted the Unix/Ingres environment into a relational database transaction-processing engine.

Ingres adds coordinated processing among parallel machines, work load sharing and distributed lock management to Unix.

It is likely that other DBMS vendors will provide add-ins to Unix that compensate for missing pieces.

- Conversion can be a huge problem. For most IBM shops, the single biggest objection to considering Unix is the tremendous investment that must be made in existing software that runs on the same IBM platforms that will be supporting SAA in the future.

Each potential user organization has to make up its own mind as to whether the overhead consumed by a conversion will pay off in comparison with the benefits of Unix outlined here.

For most companies, straight conversion will not be the answer. A better choice may be to consider developing new applications in the Unix environment. Fourth-generation languages that operate in both Unix and an existing operating system environment can help in easing the training load — and can be a mask for the underlying operating system.

Unix's emergence as a major operating system environment will provide significant benefits to those companies and organizations with enough foresight to commit part or all of their application development to Unix. Once users taste generic computing, they do not easily forget the advantages of portability and compatibility.

> ONCE users taste generic computing, they do not easily forget the advantages of portability and compatibility.

By 1990, the U.S. government will become largely Unix-oriented in its purchasing policies. In addition, European consumers will welcome and adopt Unix as a competitive alternative to SAA and as a much-needed balance to IBM's proprietary systems.

The smart user will consider Unix as an alternative as well. •

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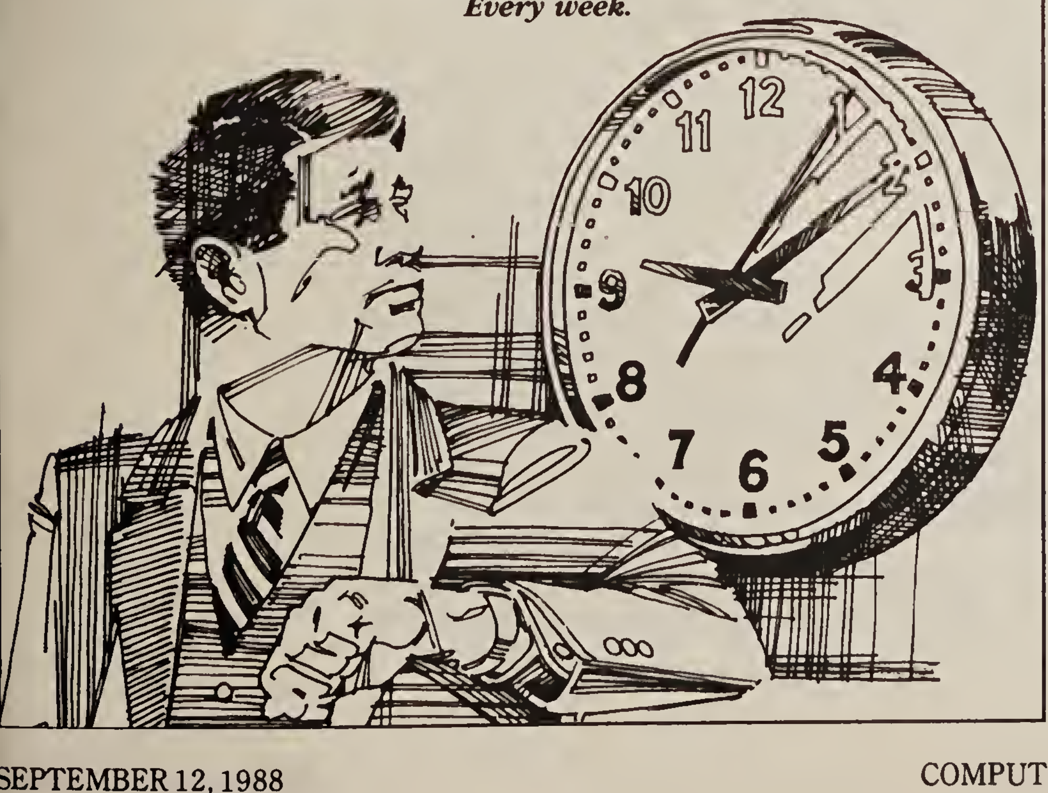

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Four groups wrestle with Unix standard

User push spurs AT&T, IEEE, OSF, X/Open

Unix really isn't a standard — not yet.

The user community, tired of wrangling over the more than 100 different Unix or Unix-like implementations, is lobbying hard for a universal standard — and the vendors and standards organizations seem to be responding.

In answer to user demands, there are four principal groups spearheading the standardization effort in the Unix world. The following is a synopsis of each group and the steps that they are taking:

- **AT&T.** As the originator and licenser of the Unix operating system, it seems likely that AT&T would wish to create a single derivative standard that would allow compatible running of most Unix applications developed to date.

Indeed, such a standard would cement AT&T's leadership in the Unix community and help the operating system capture more interest from non-Unix accounts.

And the company has been reasonably successful in moving in this direction of control by creating a new Unix System V platform.

GAINING IBM's and DEC's backing for the same implementation of Unix is bound to positively affect its adoption over time.

Within the next year, this platform will reportedly provide a unified, compatible superset of the various functions that have been implemented on earlier versions of AT&T's Unix System V, the University of California at Berkeley's Unix 4.2 and Microsoft Corp.'s Xenix.

Sun Microsystems, Inc. is currently working in this effort also, and Sun's Open Look interface product is slated to become part of the revamped AT&T System V standard.

In addition, quite a few other vendors — among them Control Data Corp., Wang Laboratories, Inc. and Prime Computer, Inc. — have announced their commitments to implementing versions of the System V standard.

- **IEEE-NIST.** Another group working on Unix standardization is the Institute of Electrical and Electronics Engineers (IEEE) in conjunction with the National Bureau of Standards — which was recently renamed the National Institute of Standards and Technology (NIST).

IEEE has created a Posix interface standard that is likely to be first implemented on Unix systems.

Indicating its likely acceptance of the IEEE-NIST effort is the federal government, which is especially interested in the Posix standard. Federal procurements are already specifying Posix compliance.

It is likely that a Posix interface standard will become widely adopted in the early 1990s.

It should be noted, however, that the Posix standard will not be limited to the Unix world. It is probable that an OS/2 version of Posix will appear in the early 1990s as well.

- **OSF.** As a reaction to the Sun-AT&T joint venture to evolve an Open Look/System V standard, the Open Software Foundation has recently been formed — amidst a lively hullabaloo.

The OSF has joined the Big Two hardware vendors, Digital Equipment Corp. and IBM. In addition to those companies, the other founding members were Hewlett-Packard Co., Honeywell Bull, Inc., Apollo Computer, Inc., Siemens AG and

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The foundation says it will build a standard Unix implementation, versions of which will be licensed to and reimplemented by the member companies.

The basis for this standard implementation will be the AIX operating system from IBM that is already available on its RT computer.

What is expected to occur under OSF's Unix effort is that within the next two to three years, the foundation's Unix is likely to be running on almost all IBM platforms as well as on DEC, HP and other systems.

And because OSF has announced a commitment to open standards, its implementation will include support for the SQL, Posix, American National Standards Institute and NIST standards. In addition, it is likely that when OSF Unix products are delivered, they will run applications software very similar to that which runs under the AT&T product.

Among software companies, Cincom Systems, Inc. and Relational Technology, Inc. have already announced their support for OSF's efforts. They are two of the earliest in a long list of software vendors that will likely be joining OSF this year and in 1989.

- **X/Open.** X/Open is an organization composed of users (among them Aetna Life and Casualty Corp., Bankamerica Corp., Eastman Kodak Co. and others), hardware vendors (including DEC, AT&T, Unisys Corp., NCR Corp. and others) and software vendors (Oracle Corp., Informix Software, Inc. Cullinet Software, Inc. and others).

The X/Open group maintains that it is committed to creating an open standards universe based on the Unix platform. But with the recent announcement of OSF, X/Open's role has become a little more uncertain.

It is likely that X/Open's eventual recommendations will parallel the products delivered by AT&T and OSF.

Interestingly, neither of those efforts has a major involvement by users of software, and that is the unique role X/Open will mostly likely play in the Unix standardization efforts.

SINCE OSF has committed to open standards, its implementation will include support for SQL, Posix, ANSI and NIST standards.

OSF a bad thing for Unix?

While it is unclear which group's standard will come to the fore, the current discussion regarding Unix standardization has been that the emergence of the foundation is a bad thing for Unix.

This line of thinking takes the approach that the anticipation of multiple Unix standards will hurt, rather than help, the issue of selling Unix as a platform to the commercial world of users.

In actuality, however, the emergence of OSF is a fortunate occurrence for the acceptance of Unix.

For one thing, it is obvious that obtaining IBM's and DEC's backing for the same implementation of Unix is bound to positively affect its adoption over the long run.

In addition, all the publicity that was generated by the OSF vs. AT&T battle could not have been bought even with limitless funds.

This invaluable publicity, combined with IBM's backing, will be much more important to the Unix operating system's acceptance than any temporary confusion in the market.

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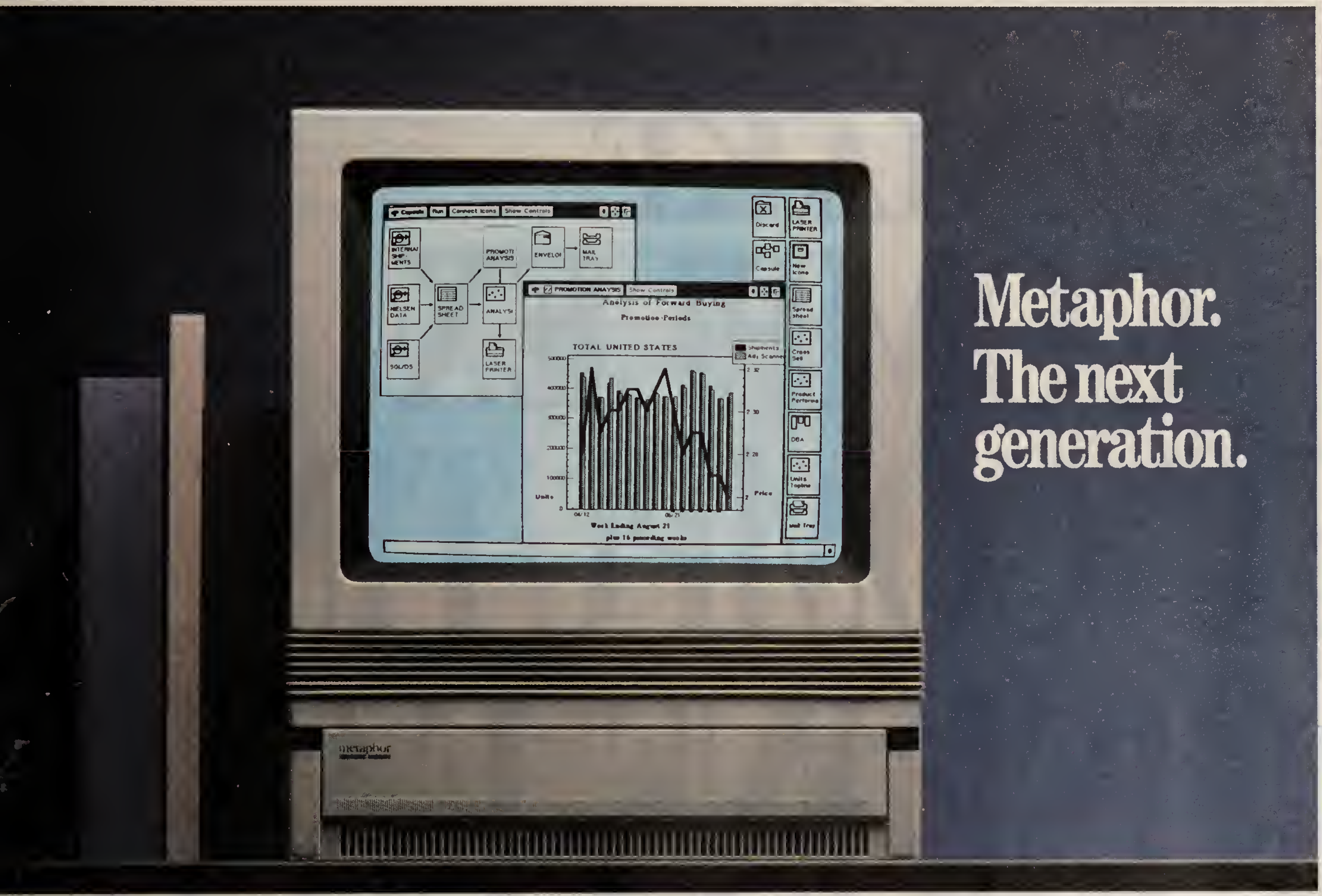

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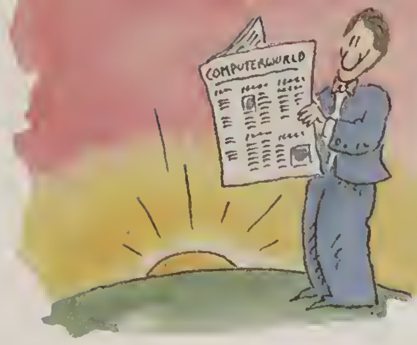

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Appraising the appraisal

Judy entered the office excited and full of expectations. She had just completed her first year as a junior programmer, and today, Bob, her boss, would administer her first official performance review. She knew she had done a superb job and Bob always complimented her on her work, so she was looking forward to praise and a possible promotion.

Judy was in shock when she left her meeting with Bob. She marched to her desk and immediately wrote her resignation. Although she decided not to hand it in, it was weeks before her performance and cheerful nature were back up to their former level. What happened?

Bob considered Judy one of his better workers, but he was locked into his company's performance evaluation format. To be "fair," he was required to give equal weight to Judy's good points and bad points.

He had no trouble listing her good points: She produced excellent work with few bugs, came in early and left late and got along with the users. He had to think hard about her bad points because nothing immediately came to mind. Finally, he re-

Continued on page 114

Strategic maneuvers

Businesses hunt for systems opportunities

BY JAMES CONNOLLY
CW STAFF

Don't let the boss read this article — it may mean more work and aggravation for everyone from the chief information officer to the newest programmer.

Since at least 1976, when American Hospital Supply Corp. developed its Analytic Systems Automated Purchasing distribution system, company presidents have been launching strategic systems with a "management-by-magazine article" approach.

That is the tactic that Nolan Norton Institute Director Thomas Johnson describes as a chief executive officer reading about a successful strategic system, clipping the article and shipping it to the CIO with a memo saying, "Let's do one of these." The CIO must then react with a one-time solution — what Johnson calls "a rifle-shot system" — that will not provide a sustained competitive advantage. He still must dedicate resources to long-term solutions.

What will the star strategic systems of the next few years look like? The consensus of observers such as Johnson is that they will be more broadly focused than the systems of the American Hospital Supply era; that they still will tend to involve distribution channels; and — of greatest import — that they will be tied to major organizational change.

Consultants and MIS executives concur that few opportunities remain for companies to earn long-term advantages by being the first in their industry to install a terminal at a customer site. That was the edge won by American Hospital Supply and American Airlines' Sabre reservations system. Those successes fed misconceptions that a firm could fool people into giving it all of their business and that a company could outwit competitors by coming up with an idea nobody else thought of, notes David Robinson, president of the Cambridge, Mass., consulting

Continued on page 110

Data View

States' woes

A 50-state survey shows MIS managers in state governments are increasingly concerned about project costs

Top problems cited

External problems

- Lack of management understanding
- Lack of management commitment
- Difficulty recruiting quality personnel
- Inadequate financing

Internal problems

- Missed programming schedules
- Programming backlog
- Costs too high
- Cost overruns

SOURCE: THE NATIONAL ASSOCIATION FOR STATE INFORMATION SYSTEMS, INC.
CW CHART

Business gets the upper hand at New York Life

BY NELL MARGOLIS
CW STAFF

Twelve years into his career at New York Life Insurance Co., Jim Bain found out what his company does for a living.

"When you're down in data processing for a long time, you think you know your company's business, but you don't — not until you step outside," Bain says. He spent 11 years in DP and applications programming before becoming one of five New York Life managers participating in the Business Analyst program: an experiment in MIS-business liaisons that has exceeded expectations in its first seven months.

The program is the most recent in a series of initiatives aimed at shaping technology into a client-driven power tool for the $40 billion company — the fifth largest insurance firm in the U.S. — and its 9,000 employees and 10,000 agents.

Bringing technology to New York Life was easy, says Michael J. McLaughlin, senior vice-president in charge of the 1,000-person Information Systems and Services Department. Positioning it for optimal performance was hard.

"We are an old-line mutual, large and entrenched, both in our insurance thinking and in our DP outlook," McLaughlin says. "The emergence of end-user computing was not, and is not, an easy process for us."

New York Life was among the first of the major insurance companies to recognize the efficiencies inherent in computers, McLaughlin says. The company invested in its first computers in the mid-1950s, notes Vice-President Geraldine Oxley.

The company's earliest in-house-developed system, still at work administering life insurance policies, was created during the 1960s. By the early 1980s, the company was extending personal computer capability, including local processing and access to mainframe data, to agents.

Continued on page 112

CLOSER LOOK

Michael McLaughlin

Position: *Senior vice-president of information systems and services, New York Life Insurance Co.*

Mission: *To oversee New York Life's transition from technology-based to client-oriented information systems through efforts such as the Business Analyst program.*

Women still battle with barriers

BY J. A. SAVAGE
CW STAFF

Women may have more opportunities in MIS than in many other fields, but they are still kept out of high-level management by a "glass ceiling," according to the author of a recently published book, *The Best Companies for Women.*

Of the 213 companies surveyed for the book, Baila Zeitz, a corporate consultant and psychologist, and co-author Lorraine Dusky studied 55 in-depth for the opportunities they gave women. "In our companies, the percentage of women [in computer science] was excellent. It's a growth area. Because it's relatively new, you avoid some of the prejudices you have in, say, manufacturing," Zeitz said.

The researchers found the greatest showing of egalitarianism in MIS at the entry level. But when women reach the top of the entry level or even the middle-management level, Zeitz said, "that's when the trouble starts."

Glass ceiling

"You can have wonderful illusions that there are no barriers probably until you're 35. That's when you bump up against the glass ceiling," Zeitz said. "You hit it sometime before you get into policy-making."

One reason firms give for the lack of women in policy-making positions is the lack of women graduates in engineering and computer science in the past.

Baila Zeitz

"Women have been in the [MIS] pipeline since 1974," Zeitz said, discounting that theory. Instead, she blamed it on other, more subtle pressures. "What happens is women start out on what looks like a level playing field. Then you find 15 years later that they're not doing as well as men."

The comfort level

Zeitz said the most important aspect of this discrimination is the "comfort level" of men at the top. When it comes to promoting people to top positions, men tend to feel more comfortable with other men, she said.

Another aspect of the comfort level, according to Zeitz, is an executive who wishes his characteristics or style of management to continue if he gets hit by a bus. Men do not think their style will be carried on by someone wearing a skirt, according to Zeitz.

Real life often gets in the way of career ascendancy. "If you want to combine a career and life, it's easier for a man who has a wife than a woman who has a husband. And time is finite," she said.

And while she said that some women are less likely to sacrifice everything for their jobs, "The real kicker comes in where the women are totally willing to give up everything. The guy [doing the hiring] looks at her and thinks there's something wrong with her."

Zeitz is also concerned about the mental health of those who are able to reach management positions while juggling a family. She said she has run into many who go into labor in the parking lot and two weeks later are back taking meetings. "I'm concerned that these women will

Continued on page 111

JOB SATISFACTION SURVEY

Continued grom page 1

college degree.

Canup is pleased to be dealing with senior managers — on the tennis court as well as in the office. "There is an awful lot of interaction," he says. "It gives me an opportunity to deal with folks across the spectrum, people of different life-styles."

On the other hand, 21% of the respondents express some degree of dissatisfaction with their position, closely tracking last year's results. Furthermore, 86% say they are frustrated with some aspect of their work, and 69% call their job high-pressure.

Nancy Plows says she likes the fast tempo and variety of her position as DP operations manager at Carbon Graphite Group, Inc., a graphite manufacturer in St. Mary, Pa. She is also serving as data administrator and information center manager. But sometimes, she says, the pace is too much. "It seems that things are never rushed, never pressured until they hit this department; then you have to have things out tomorrow, or preferably today," Plows says. "Then, if it's right, nobody says anything. If it's wrong — you did it."

The pay's OK

The *Computerworld* subscribers who took part in the survey tend to be satisfied with their salaries, and they agree that DP pays well compared with other departments in their organizations.

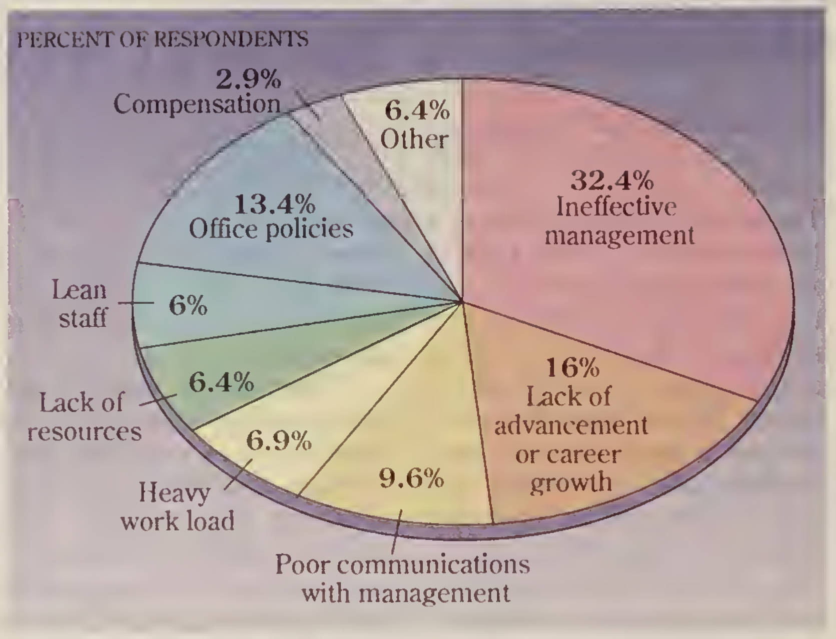
In fact, compensation was singled out as the single biggest frustration by only 3% of the respondents, a varied group that includes MIS managers (28%), systems analysts and lower level managers (22%), programmers or similar professionals (16%) and other technical managers (9%).

MIS directors are earning an average of $64,330 in salary and additional cash compensation this year, according to *Computerworld*'s 1988 salary survey [CW, Sept. 5]. Systems and programming managers, meanwhile, earn an average of $53,312, senior systems analysts get $43,545, and senior programmers earn $33,011.

The second annual *Computerworld* Job Satisfaction Survey was conducted in June by the Research Services division of IDG Communications, Inc. The survey was mailed to 2,000 of the newspaper's subscribers. With 940 completed questionnaires returned by the deadline, the mailing generated a response rate of 47%.

What's your beef?

Ineffective management was the single biggest source of frustration cited among 700 survey respondents



CW CHART

By far the leading frustration that respondents singled out is ineffective management, named by 32% (see chart above).

Chet Sheppard, MIS director at Children's Home Society, a nonprofit adoption and child care agency in Los Angeles, says MIS employees can lose their motivation if their company's top managers do not understand information systems or appreciate their potential. "There's a group of people out there, 50 or older, who are trying to outrun the computer revolution," he says.

After ineffective management, the most common source of frustration is lack of advancement or career growth, selected by 16%.

This issue prompted Otto Stuckmaier to leave an Illinois pharmaceutical company where he was a senior programmer/analyst, the job he held when he responded to the survey three months ago. "There was no place for me to go internally," he says. So he accepted the position of assistant director for technical services at Joliet Junior College.

Many DPers note that their field is characterized by a lack of career opportunities. First, many technical professionals find it difficult to become managers because they lack people skills or business knowledge.

Leonard Kopec, a senior systems analyst for the city of Colorado Springs, says there can be reluctance to take the plunge. "You've got to make a decision along the way," he says. " 'Should I cut the thread on the technical side or be satisfied with a particular level? If I cut the thread on my technical background and the new job doesn't work out, where would I go?' "

Some data processing people have avoided this choice by simply taking their talents elsewhere when they felt blocked in their job. "It has been awful easy," Kopec says, "to walk down the street for more money."

Career opportunities also can be limited when MIS is out of the mainstream at a company. Stuckmaier says the fast track at the pharmaceutical firm in which he worked is for employees with a background in chemistry.

Dedra Blackwelder, an applications programmer at Post, Buckley, Schuh & Gernigan, a Miami engineering firm, says the small size of the DP department there leaves little room for growth in DP, adding that her lack of an engineering degree limits alternative paths at the company.

Training would help, Blackwelder says. Moving into computer-aided design and manufacturing at the firm would be interesting, "but you never have the opportunity to get into it," she says. "You can't ever seem to get the time to learn anything new."

Sources of satisfaction

Opportunity for advancement is rated the most important, yet among the most elusive, elements of job satisfaction[1]

	Importance[2]	Satisfaction in current position[3]
Opportunity for advancement	3.34	2.57
Variety of responsibilities	3.32	3.01
Salary	3.25	2.88
Success of company	3.25	3.01
Co-workers	3.15	3.04
Retirement program	3.03	2.88
Nonmonetary recognition	3.02	2.48
Reputation of company	3.02	3.10
Work load	3.02	2.77
Performance review process	2.92	2.62
Company spirit	2.83	2.52
Physical environment/office	2.81	2.73
Flexible work hours	2.63	2.99
Location	2.61	3.11
Daily commute to work	2.55	3.11
Profit sharing	2.36	2.57
Bonuses	2.32	2.34
Industry of company	2.24	3.13
Child care	1.52	2.64

[1] Base of 916 respondents
[2] 4 = Very important, 3 = Important, 2 = Somewhat important, 1 = Not important
[3] 4 = Very satisfied, 3 = Satisfied, 2 = Somewhat satisfied, 1 = Not satisfied

CW CHART

Recognition

Concern with career growth also stands out in rankings of 19 factors, first according to their importance and then by satisfaction with them in respondents' current jobs (see chart below). Opportunity for advancement ranks first in importance but near the bottom in satisfaction.

The DPers responding to the survey also rate "nonmonetary recognition" as clearly important to job satisfaction — and score it even lower than career growth in terms of their satisfaction.

Lack of nonmonetary recognition may be one factor underlying another of the commonly cited frustrations — poor communications with management, which was selected by 10%.

Recognition and communication are top concerns of Cami Chedester, computer systems coordinator at Dover Corp.'s Norriseal Controls Division in Magnolia, Texas. The division is a maker of valves and controls for the oil industry.

"If [managers] don't communicate that you did your job well, then you spend too much time trying to analyze your own performance," Chedester says. "Positive feedback takes so little time, but it's so important because it lets you know you're on the right track."

Blackwelder says she is troubled by a general lack of communication from top management. "You have absolutely no idea what else is going on at the company because no one tells you," she says. "You don't really know when you do things if it's what top management wants you to be working on."

The managers and professionals responding to the survey also deem work load an important factor — and say they do not like working as hard as they do.

Gail Chapel says she faces a heavy work load at the small private trust firm in Seattle for which she is MIS director, even though she describes it as a good place to work.

With responsibility for communications with a remote mainframe, telecommunications and microcomputers, Chapel says it is tough to balance the tasks of responding to user requests, keeping up with technology, troubleshooting and training and assisting her own staff of three.

"You can't settle down on any one assignment and work on it," she says. "The job inherently is so diversified and yet so specialized that you're caught in a bind: How do you keep up with the myriad tasks and yet be technically proficient in all of them? It's definitely challenging."

Looking at the issues

The issue of inadequate management rears its head again in expressions of agreement or disagreement with statements about MIS. Just under three-fourths of respondents agree that unrealistic deadlines and expectations from upper management are a problem for MIS workers.

Robert Angle, a supervisory programmer/analyst with the U.S. Army Information Systems Engineering Command in Indianapolis, points out one way unrealistic deadlines arise. He says some projects must be completed by a deadline set without regard to the work involved; for instance, an accounting system must be installed by the end of a fiscal year.

"We have to work back from the date set, rather than start up front and say we need so much time for the analysis and programming," Angle says.

What will you do?

What are dissatisfied MIS managers and professionals prepared to do? About one-fifth of those who responded to the survey are looking for another job; 14% say they are now seeking a change, and another 6% say they are always looking.

Slightly more than half — 52% — say they have considered changing professions. The most popular alternatives are self-employment (14%) and teaching (12%), followed by other business functions. Only 2.1% choose consulting (see chart below).

Actions do not always follow intentions, however. Of respondents who say they have considered changing professions, 60% say the chances of actually doing so are slim, and another 8% say there is no chance of making the move.

Some barriers to the plans are obvious. Angle, who has been in the Army for 15 years, says his notion of owning a store or service business "would require more capital than I'd ever be able to accumulate."

Blackwelder is doubtful she will follow through on thoughts of trying to work as a writer. "You get in a certain income bracket and it's kind of hard to go out and find a new career," she says. "People are getting so specialized at what they do."

Other obstacles to new careers are more subtle. Pete Sandowski, a programmer at American International Group, Inc.'s data center in Wilmington, Del., contemplates working as a stock broker but is not sure how well he would do relying on sales commissions. "I guess it's a matter of confidence," he says. "Do you have the ability to switch from something you're comfortable in and try something new?"

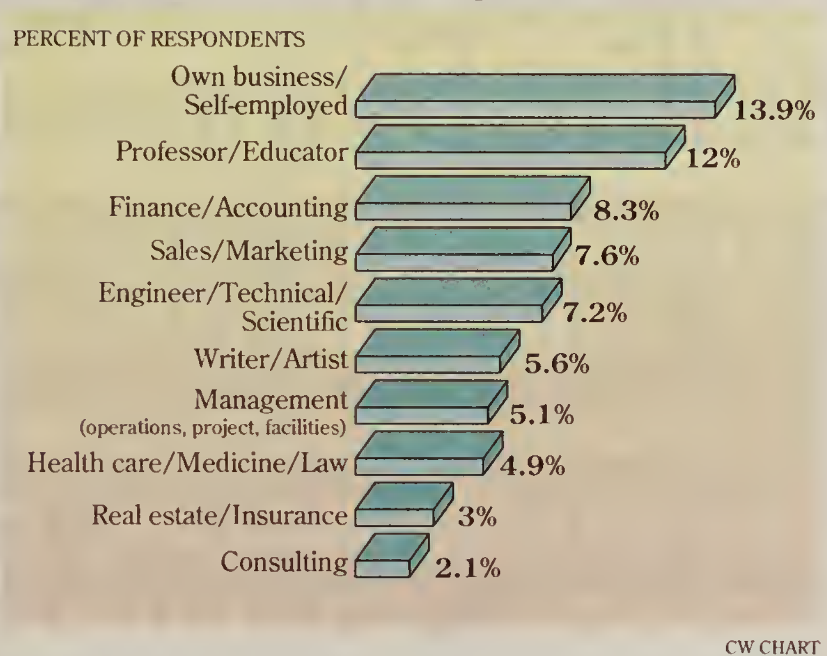
However, 33% rate their prospects for changing professions as good to very good. One of them is Carbon Graphite's Plows, who hopes to move on to a marketing job at the company. "I would like to stay with this company to watch it be successful," she says. "At the same time, I don't think I can stay in this type of pressure cooker in MIS."

And Steven Greco, MIS manager at Bramalea California, Inc., a Costa Mesa real estate developer, says he is fascinated with computers but thinks he can get more satisfaction from rock music. He spends several nights a week playing drums with a band, hoping for the big break.

"I am pursuing a music career parallel to my profession as a systems manager," Greco says. "There's not enough money in it now. But if the opportunity was there, I think I would definitely jump. My heart is more in it."

What would you rather do?

Self-employment is the most popular career alternative among 432 respondents who have considered changing professions



CW CHART

MIS and the issues

*Respondents find MIS exciting and high-pressure; they say management views MIS as strategic and holds unrealistic expectations**

	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Micros have diminished the power of MIS/DP in my organization	17%	50.7%	10.8%	17.4%	3.5%
Management views MIS/DP as important to the strategic position of the company	5.1%	20.7%	7.9%	49.1%	16.7%
Unrealistic upper management expectations and deadlines are never a problem for MIS/DP	22.7%	50%	10.5%	14.7%	1.5%
We never have enough money to do the job right	4.8%	47.1%	13.1%	26.7%	7.6%
End users are very satisified with MIS/DP	5.3%	33.6%	11.8%	45.2%	3.3%
MIS/DP is a pretty unexciting vocation	37.9%	43.3%	6.1%	9%	3.1%
In comparison with other departments in my company, MIS/DP usually commands pretty high salaries	4.4%	24.5%	14.5%	47.2%	9.2%
I cannot keep up with new technologies and techniques	4.9%	42%	6.1%	39.4%	7%
I have a high-pressure job	1.4%	22.2%	6.8%	52.3%	16.9%
My MIS/DP department is adequately staffed	11.4%	41.5%	4.1%	37.6%	5.2%
Turnover in MIS/DP positions is high	5.1%	43.7%	13.9%	31.3%	5.6%
Networked PCs are increasingly handling corporate computer needs	5.6%	33.1%	23.6%	32.6%	4.6%

* Base of 909 respondents

CW CHART

'And I want to pitch for the Red Sox'

Even *Computerworld* subscribers who say they are satisfied with their current position think about other occupations. Many would like to go into another corporate function; some would run their own business, practice law, teach or write. Others have less common ambitions.

Jon Korejwa, DP manager at Thermatru Corp., a door manufacturer in Toledo, Ohio, thinks he will go back to independent sales work, which he has already done during a break from a 20-year MIS career. "It would be nice to find a hot product and work a territory," says Korejwa, who adds that he wants to make more money and be his own boss.

He is confident in his ability to sell but says he harbors no illusions about the glamor of the field. "It's not that big of a mystery, it's just hard work," he says. "You have to get yourself out of bed everyday and deal with people you may not like."

Really cookin'

Bill Goedecke, 34, a system manager at Chevron Corp. headquarters in San Francisco, also seeks to return to a previous position — chef, preferably "Southern French and Northern Italian with a West Coast bent."

Goedecke enjoys the personal contact of cooking and a tempo faster than what he calls the sometimes "deadly" slow pace of a corporate headquarters. However, as a chef, his hours were long and he didn't make enough money. "If I could get the money, I would consider becoming a partner in a restaurant, or build one," he says.

Kenneth Litwak, 32, a programmer/analyst with the county of San Bernadino in California, would like to run bicycle tours. "I'm a very avid cyclist," Litwak says. "After all the time I've spent indoors chained to a desk, it's very appealing to me to have work I can do outside."

Litwak would expect to face pressures running bike tours — but pressures different from those MIS professionals run up against. "It wouldn't be the deadline sort of pressure. I wouldn't have to follow the precise rules I do in DP," he says. "I probably will do it someday."

Glass housing?

Robert Sanborn, who is manager of technical services at Merchants Service Corp. in Indianapolis, says he would like to do overseas economic development work, perhaps building housing with a non-profit agency.

"I have several outside interests, and one is international traveling, particularly in Africa," Sanborn says. "There's so much that needs to be done over there." Financial security is the major consideration holding him back, he says.

While he finds DP exciting, Oren Brown, a programmer/analyst with the Florida Department of Administration in Tallahassee, senses a higher calling. He would like to be an evangelist. "I see a purpose in life — spreading the good news about Christ around the world," he says.

Brown, a member of the University Church in Christ, is not sure about the chances of realizing his ambition. "If it's there, great; if it's not . . . I'm not saying it will happen. It's up to Him."

DAVID A. LUDLUM

Strategic

FROM PAGE 107

firm Index Group, Inc.

"I think what has really shaken down now is that we are seeing which companies have the will and the power to develop systems," Robinson says. "In the old days of competitive systems, it was you first and then all of the others."

Today, according to Robinson, a handful of companies in each industry have the power to match each other with competitive systems. Lesser firms will fall behind, particularly as systems development feels the pinch of the October 1987 stock market crash.

Robinson expects the successful systems to be those that match technology to human needs and lead customers to identify the system with the company. Competitive systems now are at the stage where they have more practical uses, he says.

Noting that he was troubled by Allegis Corp.'s inability to properly merge its United Airlines subsidiary with hotel and car rental companies, Robinson says, "If anyone ever laces together a cradle-to-grave travel company, they are going to get some real nice margins." He cites the examples of a hotel that uses computers to ensure that even last-minute charges such as a morning telephone call are immediately included in a patron's final bill and the ability of a rental car company to have a car waiting to go when a customer's plane lands.

Nolan Norton's Johnson

Johnson, whose Nolan Norton Institute is a division of the Lexington, Mass., consulting firm Nolan, Norton & Co., agrees that placing more terminals in customers' hands is insufficient to ensure long-term results.

"Now you have to build the database and the telecommunications nets. You need to change the sales distribution channels and the people. You may have to get rid of regional sales locations and probably change the role of the salesman to more of a relationship person. All of that is not just a strategic system, but rather transforming the organization," Johnson says.

He emphasizes that a company must use information to make itself a quality supplier and break out of the traditional, hierarchical organizational structure. This breakout will allow peers to share information in different departments and decisions to be based on that direct communication.

"People are putting in wonderful technology, but the real change and the long-term benefit is fundamental change in the way in which you do business. A competitive advantage is occurring now when people who have made the investment in technology are changing their organization and changing the way work is done," Johnson says.

James C. Wetherbe, director of the MIS Research Center in the University of Minnesota's Carlson School of Management, cites organizational change and databases as the keys to new systems.

"The strategic systems that are really going to be different are going to come from the people who can get their database act together. They will have a good intraorganizational information system and reorganize to take advantage of it," Wetherbe says.

Looking at financial institutions, Wetherbe notes that most cannot look at a customer as a single account, so that a bank employee who bases an interest rate on the small balance in a cash management account does not consider the larger amount the customer has invested in bonds through the same bank.

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Companies in the garment and retail fields — in which control over production and distribution of clothing is segmented among numerous players at each of many steps — have just begun to break down barriers that have cost the industries $25 billion per year in markdowns for poorly selling items and the inability to quickly restock hot items.

"People have to realize that information is a shareable resource," Wetherbe says, adding that at least one company has used information links to manufacturers to reduce the time it takes to restock shelves from several months to as little as eight days.

Wetherbe recommends that CIOs plan systems to meet the rapid changes in marketing in all industries by being innovative and receptive to suggestions. "The CIOs ought to be having lunch with the sales force more often so they can find out what is going on. Even better, the CIOs ought to be having lunch with the customers," he advises.

Gary J. Biddle, vice-president of MIS at American Standard, Inc., adds, "In the industrial sector of the U.S., if there are any strategic applications that will take a leading edge, they will be applications that make it easier for customers to do business with us. Hopefully, we will end up with an entirely seamless concept."

Biddle says he expects a continued focus on channels of supply and distribution, just-in-time manufacturing and quality control. All of those relate to providing customers faster delivery of quality products.

He also sees manufacturers looking beyond their own customers to their customers' customers to anticipate their needs and the trends that they are setting.

Oil angle

But not all of the strategic systems will focus on marketing and channels of distribution. Jack Murray, vice-president of information services at Atlantic Richfield Co. in Dallas, looks at computing from the viewpoint of oil exploration and production. He says of oil companies in general, "We are spending more and have begun to tilt our computing resources in the direction of exploration and production . . . It's a question of focus and commitment to applying state-of-the-art technology.

"In the last five to eight years, we in the industry have spent a lot of time upgrading our base-processing systems, generally to address business management. As we look at the work that has been done there, we realize we have done a lot of what can be done," Murray says.

He adds that the oil industry is now more likely to turn MIS resources toward areas such as computing-intensive and graphics-oriented seismic interpretation and reservoir modeling — "squeezing the most that you can out of a well."

For whichever areas are the focus of strategic systems, Index Group's Robinson has a word of caution. He notes that it may take two or three years to develop a system and two or three years to pay for it. "That's no good if your business is changing faster," he concludes.

Women

FROM PAGE 107

show up in my office 10 years from now saying they paid too great a price. But realistically, until companies change, women at a certain level of management can't take maternity leave," Zeitz said.

Crash the ceiling

The demise of the baby-boom generation and the increasing savvy of career women will eventually shatter the glass ceiling, according to Zeitz.

She said men have to realize that for business to succeed when there is a diminishing pool of people starting work each year, they will have to fully use all the talents of both genders. "That's where it will break down in the 1990s," Zeitz said.

In the short term, Zeitz predicted women who bump against the glass ceiling will simply move to greener pastures or at least office buildings with multistoried atriums, while companies that remain prejudiced will suffer.

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Currently scheduled participants listed on facing page.

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New York Life

CONTINUED FROM PAGE 107

By forging ahead, however, the company was falling behind.

"It was clear that the insurance industry was changing, the company's needs were changing and we couldn't move quickly to accommodate the change because we were bound into large systems that were hard to change," McLaughlin says.

Four years ago, under the aegis of then newly appointed McLaughlin, New York Life's information establishment set out to change its course.

"We're coming out of an era when the computer types would decide what project to do and then announce it to the business," McLaughlin observes. That has changed. He calls the DP group a vendor shop responsible for serving New York Life's business units.

McLaughlin anticipates the day when business people routinely approach Information Services with problems — not just computer problems, but business problems. Information processing would marshal its resources to discover and apply technological solutions. "We're not there yet, but we're working on it," he says.

The Business Analyst program, inaugurated in February, typifies the new New York Life information establishment: pragmatic and client-driven.

The company identified five junior-level information services managers to send to five corporate profit centers. They are "to serve as that department's technology eyes, ears and reporter to open up new ideas to the department head about where and how technology could come into play to meet that particular department's needs," Oxley notes.

Information systems origins notwithstanding, "the Business Analyst is the department head's person," says Vice-President Thomas Pettibone, who, with McLaughlin, launched the Business Analyst program. The distinction, he says, is far from semantic; the fact that the department head can view the analyst as a team member rather than as an emissary from the esoteric world of technology is pivotal to the program's success.

Pettibone created a similar program at Procter & Gamble Co., where he served as MIS director before joining New York Life last year.

Pettibone reported that customers in the profit centers are enthusiastically calling for continuation of the program. He says Information Services hopes to field a sixth business analyst before year's end. "Our own department likes it because it helps us do our jobs better," he says.

Bain concurs. Posted to the Agency Department and charged with understanding its business needs and recommending appropriate uses of technology, Bain found that his new department's understanding of his old department's function was about on par with his own perceptions, "and frankly, I didn't know a thing about the Agency Department.

"There's a lot of unarticulated interest in the business world," Bain says, "but people don't know what to ask, or who to ask it of, so it remains unarticulated."

"It's been great having Jim here," says Lee M. Gammill Jr., senior vice-president in charge of the Agency Department. "Jim isn't asking us what business life is like in the Agency Department, he's living it. If a computer guy is housed with you, then you end up having conversations in

Continued on page 114

A few kinds of experience

"If you had told me 10 years ago that I'd be in this job today, I would've said you must be smoking something," says Michael J. McLaughlin, senior vice-president in charge of New York Life's information systems and services department.

An attorney who spent a decade plying his trade in New York Life's legal department, McLaughlin also served in personnel, marketing and human resources before joining the department he now heads.

His seemingly unorthodox background, however, serves him well in guiding the transformation of information systems from technology-centered to business-driven.

Armed with a businessman's long-term insights and a technology-oriented executive's outlook, McLaughlin has not only spearheaded Project Steer — a $150 million, five-year effort to update systems and reposition them from a transaction to client orientation — but also such initiatives as the Business Analyst program and a consultant-aided "technology awareness" program geared toward "educating department heads to see technology as their new trump card."

During the last year, McLaughlin says, "there's been a real turnaround in making the company more aware of what technology has to offer, not as whiz-bang science, but in terms of business goals." This is his proudest accomplishment as MIS director at the new New York Life.

His biggest frustration? "Not seeing it even sooner."

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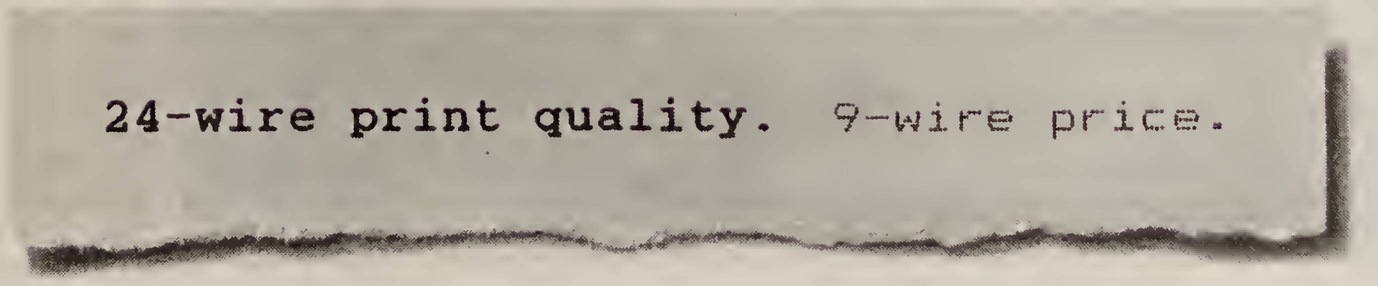
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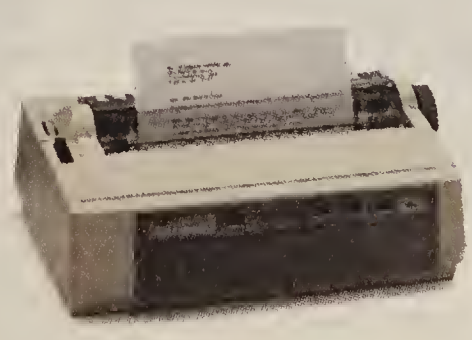

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Ferruggia

CONTINUED FROM PAGE 107

membered that he had noticed her spending a lot of time at the water cooler. Although it had not affected her work, at least it was something he could list as a negative. When Judy objected to this in their meeting, he felt threatened and defended it more zealously than he really believed it had warranted.

Bob was also required to give Judy a numerical rating from 1 to 10. Since these ratings were also used to determine the dollar amount of salary increases, there was pressure from management to keep them low. Bob's manager, who had to review and approve the ratings, never let anyone have a 10 because "no one is perfect." He also disapproved of 9s because he felt that meant people were overqualified for their jobs. So Bob gave Judy an 8, the highest his manager would accept without special justification. Bob's manager knocked this down to 7 because he was under budget constraints. Judy almost cried when Bob told her that her rating was 7, even though he tried to explain that this was a very good rating.

Does this seem farfetched? Scenes like this happen every day in some of the best-run companies in America. Why? Companywide performance appraisal systems are very fair and very effective for a large number of employees, yet they break down when applied to systems people, who on the whole are very creative and self-motivated.

Systems professionals have an uncanny sense of how good their work is and how it compares with their co-workers'. Formal performance reviews for such people are still necessary, but not to tell them how well they are doing — they already know — or to motivate them to do better, because they are generally motivated internally, not externally. The purpose of these reviews should be to prove to them that their managers understand how well they are doing and to support or increase their motivation.

Performance reviews tend to de-motivate people who are already highly motivated. If someone knows that he is doing an excellent job and his boss tells him he is doing only seven-tenths of an excellent job, that only proves to him that no one appreciates his efforts. Many companies take a schizophrenic attitude toward their employees: They want to hire only the best people, but they balk at rating everyone as the best.

What is the solution? It is very simple and has been used with great results by another group that depends on the morale and self-motivation of its employees: sales and marketing. Ask the salesperson from your computer vendor about their review programs and you'll be amazed. Good sales outfits go out of their way to rate people as highly as possible and to publicly hype the achievements of their best people. They are constantly holding contests, giving out vacation trips and looking for ways of providing high-visibility bonuses.

What lessons can we learn from this? First of all, information systems review methods must be separate from the rest of the company. Next, ratings should be allowed to be as high as possible, which means they should not be tied to automatic salary increases or promotions. Finally, MIS should hand out frequent small bonuses or accolades for work well-done. The way to motivate highly motivated people is to increase their self-esteem, not dampen it.

Our computer vendors have been incredibly successful at selling us piles of new hardware every year. Let's start stealing some of the motivation systems they've been using to do that.

Ferruggia is a psychologist and president of Personal Excellence, Inc. in Warwick, N.Y.

New York Life

CONTINUED FROM PAGE 112

which you have no idea that there's a technical aspect until he says, 'Hey, did you think . . .' And, of course, we didn't, but now we will."

One such interaction led to the executive information system now running on Gammill's IBM Personal System/2. "It lets me bring up 200 offices and every single product therein," he enthuses. "The next step will bring in each individual agent." The raw data, he says, was always technically available but was on paper, which effectively prohibited any efficient use of the data for review and forecasting. The executive information system, Bain noted, has moved quickly from exotic to indispensable. "Something they weren't sure they wanted," he said, "is now something they have to have."

"We're now heading into a major repricing project that will be heavily dependent on electronics," Gammill says. Bain's input, he adds, makes easy what the Agency Department never realized was possible. "And he also saves us time and money by telling us what we can't do with technology; he acts as a catalyst, but also as a watchdog."

"A lot of times," Bain adds, "I'm just a traffic director, telling people where to go." Mundane though it sounds, this function can be welcome. "For example, our company's field-office directory has always been on paper. That made it so hard to reproduce and distribute that, by the time they got it out, it was already stale."

That meant 3,800 copies of the directory were constantly outdated. After a quick fix by Information Services, the directory arrives on-line and on time.

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INDUSTRY INSIGHT

Clinton Wilder

The firm they love to hate

They dominated all competitors for years, winning everything in sight and getting a tad arrogant in the process. As a result, many people loved to hate them, hooting whenever they stumbled. When they showed signs that the glory days were over, it seemed everyone came out of the woodwork to criticize and gloat.

"They" could be the New York Yankees of the 1950s — or the Lotus Development Corp. of the 1980s.

Lotus-bashing has been a popular industry sport this year, and it's easy to see why:

- Chairman Jim Manzi's sarcastic demeanor has earned him few friends, and his public image particularly suffers next to that of beloved company founder Mitch Kapor. Making the cover of *Business Week* as the nation's highest paid executive (thanks to highly lucrative stock options) didn't endear many to Manzi, either.
- From Jazz to Modern Jazz and beyond, Lotus has made move after ill-fated move to diversify away from the 1-2-3 spreadsheet. Detractors love to sneer at Lotus as a one-product company. Microsoft's inroads into microcomputer applications crystallize the criticism.
- Earnings growth has plummeted, to a meager 6% in the second quarter ended July 2.
- The well-publicized delays in Release 3.0 of 1-2-3 have earned snickers from competitors and a spate of stock dumping from investors.
- Insider stock selling and a steady stream of high-level executive departures have resulted in a series of negative headlines.
- And, quite frankly, Lotus' hostile corporate attitude toward the media is comparable to the view held by Dan and Marilyn Quayle. Suffice it to say that Lotus has not accepted its bad press gracefully.

But amid all this smoke, cooler heads — including many prominent financial analysts — have not picked up the shovels to help bury Lotus. There are good reasons why.

Continued on page 118

Andersen's global reach boosts MIS consulting

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — When Arthur Andersen & Co.'s Management Information Consulting division puts together a team to work on a project, the programmers are just as likely to come from Manila as from the firm's headquarters here.

That is the global perspective expressed by Stanley L. Cornelison, managing partner of the firm's worldwide consulting practice, and George T. Shaheen, managing partner of U.S. consulting operations, in a recent wide-ranging interview with *Computerworld.*

Shaheen, *managing partner of U.S. consulting operations*

The sheer size of Andersen's reach is indicated by its operations in 49 countries and 40 U.S. cities. But in the last 12 months, Andersen managers have reshaped the consulting organization to give the system greater flexibility. The most dramatic change came one year ago, when the practice was changed to promote grouping by skills rather than geography.

"We've removed the natural contention for turf and moved to create larger critical masses of expertise," said Shaheen, who was named to his post this spring. Prior to that, he was the Southeast regional manager, based in Atlanta.

As consulting has emerged as the primary growth area for the Big Eight auditing firms, most have struggled with a clash in corporate cultures. During the last two years, there have been tugs-of-war between regional consulting offices and between the mainline accounting businesses and their emerging consulting units.

One recent clash at Arthur Young, for example, led to the mass resignation of some top Midwest consultants. The group then formed an independent consulting firm, Technology Solutions Co. (CW, June 20).

Andersen's Cornelison

Andersen is also feeling the effects of rapid growth in its consulting practice. Its information systems consulting business is expanding at more than 25% annually and accounted for 36% of Andersen's $2.32 billion overall revenue in fiscal 1987. As the ultimate coordinator of the consulting practice, Cornelison is working to manage that growth. He is willing to change the infrastructure, if necessary, to match project tasks to Andersen resources and personnel.

This approach allows Andersen management to glue together project teams from centers of expertise throughout the world. As a result, one client in Atlanta found his project staffed by Andersen programmers from Chicago, Atlanta and Manila.

"It used to be that customers in any given U.S. business center would be served by the Andersen practitioner closest to them," Shaheen said. "Today, the buyer of our services doesn't give a hoot where the professional is located. He wants the best of breed."

Continued on page 122

DCA plans $25M share buy-back

BY PATRICIA KEEFE
CW STAFF

ALPHARETTA, Ga. — In an effort to stabilize its battered stock price, Digital Communications Associates, Inc. (DCA) last week authorized a buy-back of as much as $25 million worth of its common shares over an indefinite period of time.

DCA's board approved that action following a 30% plummet in the value of its stock in the previous week.

"Looking at it from a stock market perspective, [DCA stock] is dead money," said Mary McCaffrey, a DCA watcher and analyst at New York-based Cyrus J. Lawrence, Inc.

She warned it will be a long time before investors feel comfortable with the stock. "It's going to take something else to build investor confidence."

Unless that something rears its head soon, many analysts predict DCA will find itself an attractive takeover target — a change of pace for a company that has snapped up at least three firms in the last two years and is on the prowl for departmental networking expertise.

The recent selling frenzy was touched off after DCA announced an expected sharp drop — 15% to 20% — in projected earnings for its fiscal first quarter ending Sept. 30.

There is a general weakness

Continued on page 119

Excelan suffers growth pains

Could strife bring about management change?

BY PATRICIA KEEFE
CW STAFF

SAN JOSE, Calif. — Growing pains and mounting turnover at Excelan, Inc. could leave the firm open to either a change in management or a takeover, industry analysts say.

A leader in the Transmission Control Protocol/Internet Protocol (TCP/IP) market, Excelan has experienced healthy growth since going public in March 1987. It posted revenue of $15.3 million at the end of its second quarter ended July 2, compared with $9.2 million in the same period a year ago and $13.2 million in the first quarter.

However, the company has been dogged this year by reports of internal bickering in the executive offices, significant turnover, a failed merger attempt with Network Equipment Technologies, Inc. (NET) and upheaval in its sales and marketing strategy.

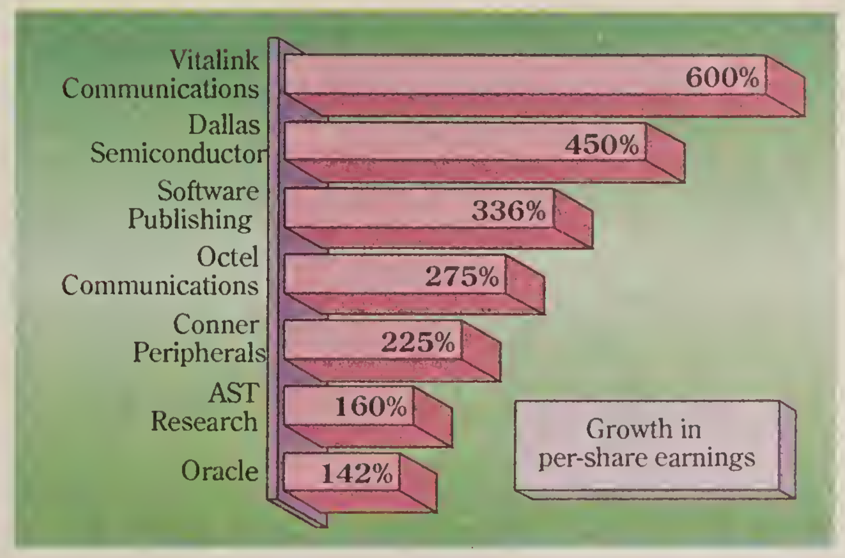
These issues constitute "simple — OK, not so simple — growing pains," said Duane Murray, Excelan's vice-president of marketing. Analysts agree that many of the problems are the result of normal adolescence, but they suggest Excelan

Continued on page 117

Data View

Second-quarter stars

Computer and semiconductor firms that more than doubled earnings in second-quarter 1988 compared with the year-earlier period



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Excelan

FROM PAGE 115

is having a tougher time than most.

"I've collected about 15 business cards from Excelan in the last year, and only one person [President Konwal Rekhi] is still there," said Doug Gold, a network analyst with International Data Corp. in Framingham, Mass.

Excelan's virtually zero attrition rate has skyrocketed, with the voluntary departure of 61 employees this year, but Murray pointed out that the company also hired 152 people. He did concede the high turnover is a matter of concern. Excelan has 450 employees.

He also protested as "outrageous" a published report estimating that 20 to 30 engineers have left. The actual figure is four, Murray insisted. But one computer firm in the valley said it has received 15 to 20 resumes from Excelan engineers.

Some analysts suggested there may be some resistance to exploring new technologies among the engineering staff, most of which has been there since the beginning of the company and probably has a lot invested in TCP/IP.

The most visible and recent staff departure was Tom Harnett, Excelan's vice-president of sales and a former IBM executive. Harnett reportedly was fired last month after his yearlong effort to revamp and refocus sales efforts reaped a lot of resignations and sowed confusion in customer accounts.

If Excelan is to continue its rapid growth, it needs to install some professional managers and start preparing for an Open Systems Interconnect-based future of integrated systems, analysts said.

Engineering-driven

Founded in March 1982, the company today is said to be heavily engineering-driven. "They need to strengthen management, sales and marketing," said Jim Weil, a financial analyst with Gartner Securities Corp. in Stamford, Conn.

Several industry analysts have compared Excelan to Proteon, Inc. in Westboro, Mass., and Ungermann-Bass, Inc. in Santa Clara, Calif., both of which struggled and floundered a bit before calling in experienced management personnel.

Following the aborted merger with NET in June, former Excelan President and Chief Executive Officer Richard Moore resigned, as was planned under the terms of the merger agreement with NET.

Cofounder Rekhi, an engineer and Moore's predecessor, promptly succeeded the outgoing Moore. "We are not actively looking for a new president or CEO," Murray said.

Exelan's engineering bent has manifested itself in a strong emphasis on OEM sales and reportedly has even spilled over into corporate decision making.

A source close to Excelan claimed the current executive team manages the firm as if it were an emotionless product, basing decisions on scientific pluses or minuses. "It is difficult to unite a large group of people that way," he said.

As a result, the source said, the corporate culture has begun to seriously erode, pushing some people out the door.

Murray, who has been with the company since its founding, dismisses this charge.

Other factors behind the exodus may be that longtime employees are either trying to cash in on their stock or are reacting to the failed merger attempt between Excelan and NET. "There's no question it left a mark. It disappointed a fair number of people," the source said.

Despite Rehki's comments in June indicating that Excelan would be open to another suitor, Murray also denied that any acquisition or merger plans are on the horizon. "We don't need to be nearly as large [as 3Com Corp. or Novell, Inc.] to be successful," he said.

Attractive target

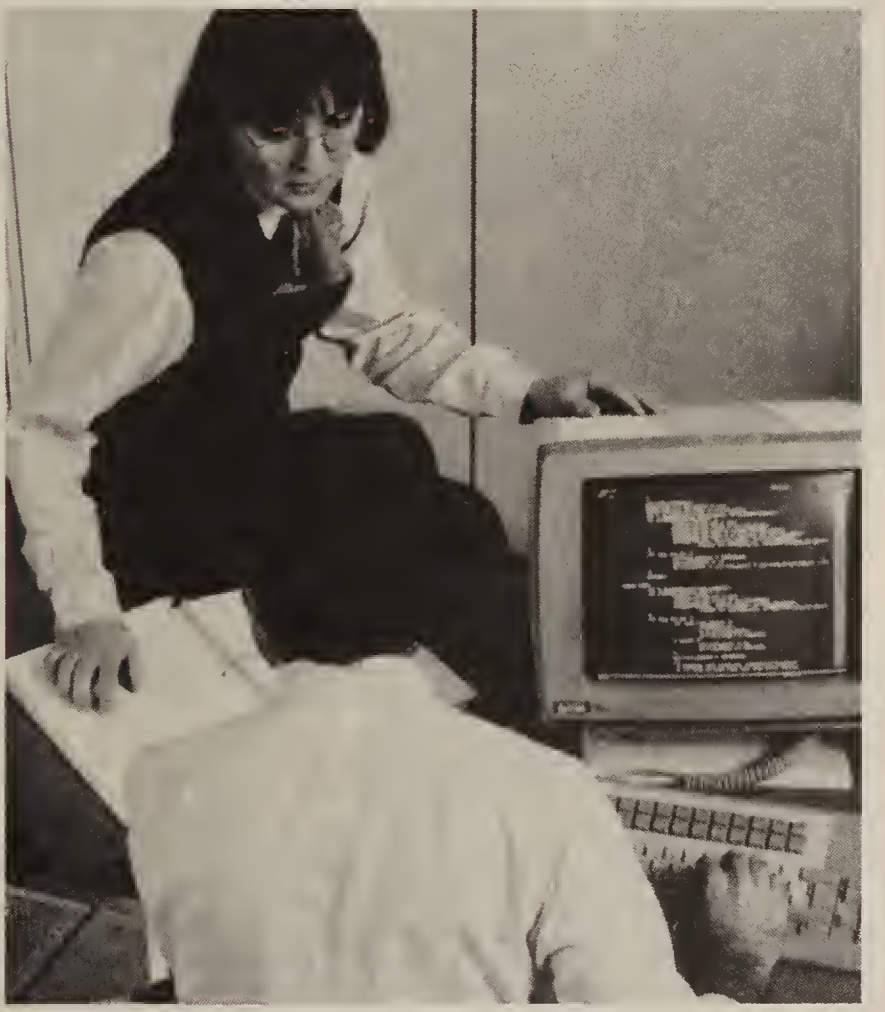
Still, in the consolidation-crazed communications industry, Excelan is seen as an attractive target.

"It's got to be going through people's minds,' said Richard Kimball, an analyst with Montgomery Securities.

Meanwhile, the TCP/IP-oriented firm needs to expand its distribution and broaden its product lines, analysts said. Murray confirmed that Excelan is working to reach customers more efficiently through channels such as distributors and value-added resellers. "They've got to go to end user-based distribution, which is always a gut-wrenching type of transition for a company with high OEM sales," Kimball said.

Murray said Excelan sees its product emphasis moving away from protocols and toward the application level as well as support for multiple types of environments — for example, Sun Microsystems, Inc.'s Network File System (NFS).

> "I'VE collected about 15 business cards from Excelan in the last year, and only one person [President Konwal Rekhi] is still there."
>
> DOUG GOLD
> IDC



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Andersen

CONTINUED FROM PAGE 115

MIS clients turn to a consulting organization to maintain fixed overhead costs while budgeting additional money for special projects, Cornelison said. Sometimes, even the largest information systems organizations find themselves unable to tackle a difficult project.

"We'd like to think that we're a kind of portable operating room brought in to do difficult procedures," Shaheen said. "We're using the magnitude of the organization and a diversity of skills and bringing them to bear on a client's problems."

Decisions about vendors, capacity planning and programming techniques have to be made quickly — often hampering a client's information systems organization from coping with continuing operations.

Inclusionary

"We are not closing the people at the company out of the project," Cornelison emphasized. "But even if the organization can do something [by itself], the question arises about whether they can do it in a reasonable time frame."

While Andersen excels at building complex IBM mainframe systems — and counts IBM itself as a major client — it also builds multivendor systems, according to Cornelison. "We cannot be coerced to go to any one vendor," Cornelison said. "That is the beauty of size. We can remain independent and make the hard judgment."

In choosing the team members, Shaheen likened Andersen's role to that of a general contractor who must choose among subcontractors to accomplish various parts of the overall job. In Andersen's case, though, that general contractor has all of his journeymen and contacts in-house.

All over the place

One recent project involved 250 Andersen consultants, including 50 from Chicago, 50 from Italy and another 25 from Manila. Often, group conferences take place through electronic mail memos and international phone hookups, according to Cornelison.

The team members can work together because all of them speak English and because Andersen has gone to great lengths to recruit and train 14,000 in-house information systems consultants, a sizable chunk of the firm's 39,600 employees worldwide.

Many consultants were recruited into Andersen's practice upon college graduation. Throughout their career, the company provides in-service training at a company-owned educational campus in St. Charles, Ill., about 50 miles west of Chicago.

"People say we have old-fashioned values in this company," Shaheen said. "But the old-fashioned values are there because of the benefits they provide to our business."

Wilder

CONTINUED FROM PAGE 115

Lotus is going through a painful maturing process. As one employee says, "It's not that they act like a big company — they act the way they *think* a big company is supposed to act."

Much has been made in the popular press about how Kapor's Hawaiian-shirt, sushi-eating software developer's culture has been replaced by Manzi's business suits and tough attitudes. Those who leave say Lotus is not the fun place it used to be. That's undoubtedly true, but where is it written that such changes make a company *weaker*? John Sculley and Apple have been almost universally praised for refocusing the company into the corporate America market. Why is Lotus admonished for a similar strategy?

Basically, Lotus is trying to grow up. Like many adolescents, it is doing so with a lot of inner turmoil. But virtually every successful young company goes through this process.

Because of its phenomenal early success and the mythic quality surrounding Kapor, Lotus is an inviting target for detractors. It's so easy to say, "If 1-2-3 stumbles, Lotus is finished." Well, people have been saying that for at least three years, and Lotus just keeps growing.

Be it a Fortune 500 volume PC buyer or a first-time clone buyer in Malaysia (overseas sales now account for about 35% of revenue), Lotus is *always* the first spreadsheet name that comes to mind in the IBM world.

You'd really have to blow it to fritter away such a marketing advantage. Lotus has admittedly made its share of mistakes, but the chinks in its armor are not serious in the long term. Anyone saying the industry should write Lotus off at this point is either myopic or just jealous.

Wilder is *Computerworld*'s senior editor, computer industry.

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Can your async network pass this simple test?

DCA

FROM PAGE 115

in the personal computer business right now, McCaffrey said. As third-quarter results are released, she said, she expects other companies to make similar reports. "It's going to be a disaster."

DCA's "extremely volatile" stock has a history of such runs, according to Andy Schopick, an analyst with Gartner Securities Corp. Similar announcements triggered sharp price declines in June 1986 and June 1987, he said.

As a result, investors already leery of high-technology stocks are especially gun-shy when it comes to DCA — despite its ample war chest and debt-free status.

Another strike against DCA, according to analysts, is the prevailing sentiment that IBM 3270 connectivity is rapidly falling out of favor as the trend toward peer-based local-area networks continues.

Analysts estimate that DCA's 3270 product line, Irma, generates 50% to 80% of DCA's total revenue. No one believes the market for Irma will go away overnight, but a gradual decline is expected. "Let's face it, all products have a life cycle, and Irma has led a charmed life," Schopick said.

So investors are taking a hard look at DCA's contingency projects, most of which are at least two quarters away:

- **10Net Communications, Inc.** The DCA subsidiary's sales have grown to about 7% or 8% of the U.S. LAN market. It is currently developing products for the Apple Computer, Inc. and OS/2 LAN Manager markets. But none of these products are expected to ship this year. Also, 10Net has unbundled its software, pitting itself against network software giants like Novell, Inc. and 3Com Corp.
- **Communications Server.** DCA and Microsoft are developing an alternative to IBM's OS/2 Communications Server. The product is considered key to DCA's future, but it will not ship until the first quarter, and some analysts contend the product is already slipping.
- **T1 switches.** DCA's one bright spot is its T1 subsidiary, the former Cohesive Network Corp. But Schopick said its revenue is sufficient only to pick up the slack if Irma revenue does not drop.

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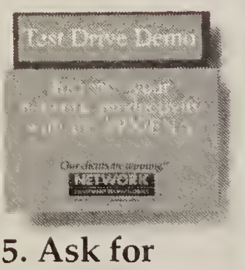

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IN BRIEF

New GE president

General Electric's **GE Information Services** switched presidents last week in an unexpected move. The Rockville, Md., unit, formerly GEISCO, named W. James McNerney Jr., former general manager of GE Mobile Communications. McNerney replaces A. L. Craig, who will become a consultant to GE Vice-Chairman Lawrence A. Bossidy.

. . . .

Gould suit filed

Six **Gould, Inc.** stockholders filed a class action suit to block the sale of Gould to Japan's **Nippon Mining**. Gould said it believes the suit is without merit.

. . . .

Modem case ends

Microcom, Inc. agreed to license **Hayes Microcomputer Products, Inc.'s** 1985 modem technology patent, settling longstanding patent litigation between the two firms. The settlement also includes a five-year cross-licensing agreement between the companies.

. . . .

Systematics names CEO

John E. Steuri has been named president and chief executive officer of **Systematics, Inc.** Steuri will join the Little Rock, Ark.-based financial DP and services provider after a 24-year stretch with IBM, where he most recently served as assistant group executive of the U.S. Marketing and Services Group.

. . . .

Bizcomp appeal fails

Sunnyvale, Calif.-based **Business Computer Corp.**, generally known as **Bizcomp**, has failed to overturn a federal judge's decision that invalidated a patent the company had tried to enforce against modem industry competitors. The U.S. Court of Appeals further stated that the firm may not impose license fees or patent infringement charges against companies that make or sell modems using technology covered in the invalid patent.

. . . .

Concurrent income rises 82%

Tinton Falls, N.J.-based **Concurrent Computer Corp.** reported that net income for its fiscal year increased 82% over year-earlier figures to $14.4 million. Quarterly revenue for the firm, however, posted a substantially lower rate of increase, gaining 6% to $263.1 million. The figures do not include results of **Massachusetts Computer Corp.**, which is in the process of merging with Concurrent.

NICKELS & DIMES

Dell Computer Corp. reported $55.5 million in revenue for the second quarter ended July 29, compared with $35.7 million one year ago. Profits were $3.3 million, or 19 cents per share, compared with $1.1 million, or 10 cents per share, in the like period last year.

Televideo Systems, Inc. reported revenue of $22.9 million for the third quarter ended July 29, compared with $22.4 million last year. The company reported a net loss of $10.5 million, or 22 cents per share, compared with a net loss of $2.8 million, or 6 cents per share, in the corresponding quarter last year.

Corporate Software, Inc. announced revenue for the second quarter ended June 30 of $20.8 million, a 53% increase over the $13.6 million reported for the like period last year. Profits were $634,000, or 15 cents per share, compared with $396,000, or 14 cents per share, last year.

Aldus Corp. reported revenue for the second quarter ended July 1 of $19.2 million, a 106% increase over the $9.3 million reported in the second quarter of last year. Profits were $3.3 million, or 26 cents per share, a 75% increase from the $1.9 million, or 17 cents per share, reported in the like period last year.

Commodore International Ltd. announced revenue for the fourth quarter ended June 30 of $215.2 million, compared with $190.4 million last year. Profits were $12.2 million, or 38 cents per share, compared with $2.1 million, or 6 cents per share, last year.

Borland International reported revenue for the quarter ended June 30 of $22 million, compared with $14.6 million last year. Net income was $501,000, or 1 cent per share, compared with a net loss of $529,000, or 1 cent per share, in the like quarter last year.

Tandy Corp. announced net income for the year ended June 30 of $316.4 million, or $3.54 per share, compared with $242.3 million, or $2.70 per share, one year ago. Revenue was $3.8 billion, compared with $3.5 billion in the previous year.

For the fourth quarter, net income was $57.2 million, or 64 cents per share, compared with $44.4 million, or 49 cents per share, last year. Revenue for the quarter was $813.5 million, compared with $736.7 million in the comparable period last year.

Ultimate Corp. announced revenue for the first quarter ended July 31 of $46.2 million, compared with $45.9 million in the same period one year earlier. Profits were $1 million, or 10 cents per share, compared with $3.9 million, or 40 cents per share, in the like period one year ago.

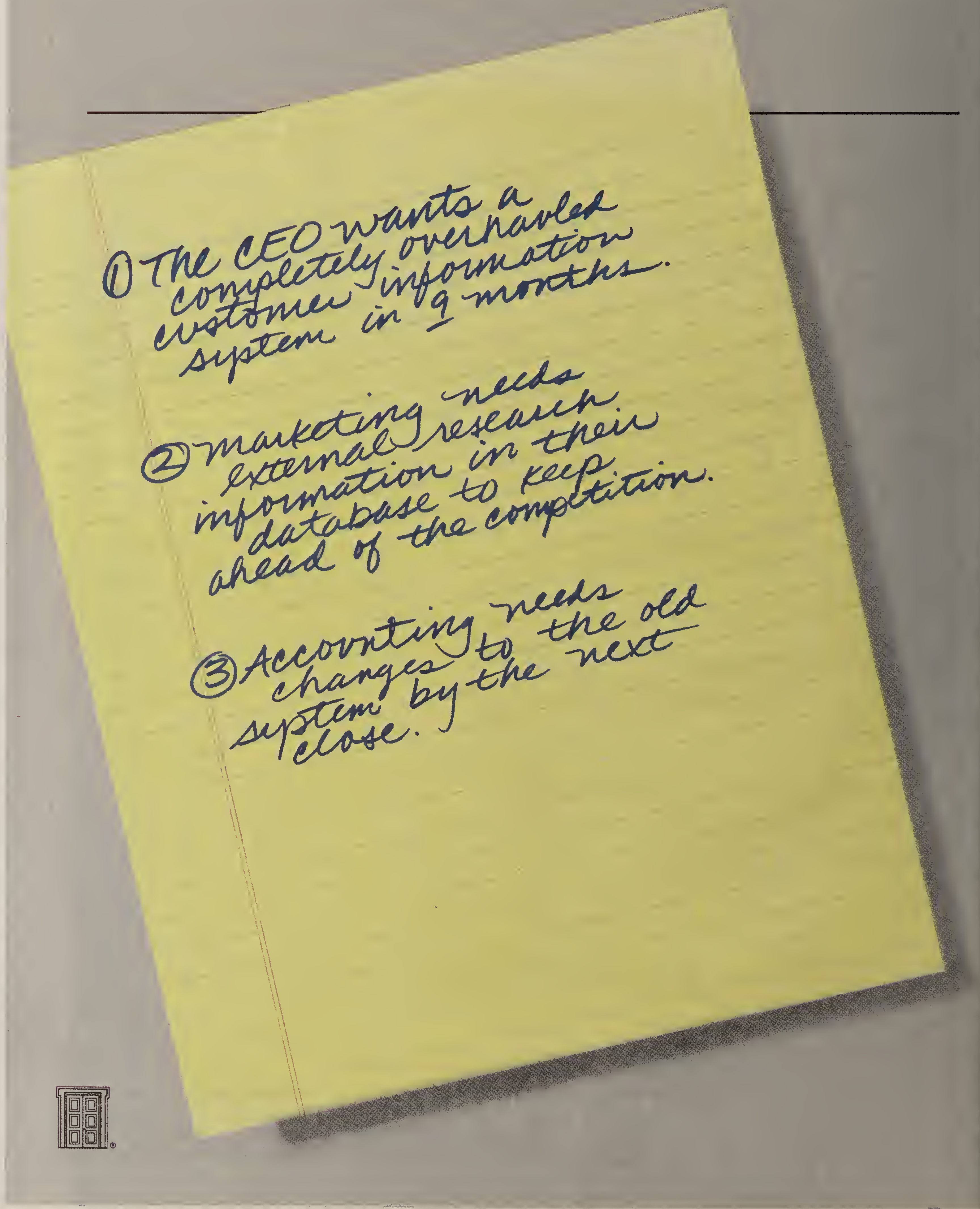
Encore Computer Corp. reported revenue for the third quarter ended July 30 of $9.1 million, a 153% increase over the $3.6 million reported in the same quarter last year. Profits were $394,000, or 2 cents per share, compared with a net loss of $2.5 million, or 11 cents per share, a year ago.

Emulex Corp. announced revenue for the fourth quarter ended July 3 of $34.2 million, compared with $27.4 million last year. Profits were $2.8 million, or 23 cents per share, compared with $246,000, or 2 cents per share, in the comparable period last year.

Revenue for the year was $125.1 million, compared with $103.8 million last year. Profits were $9.1 million, or 75 cents per share, compared with $3.5 million, or 26 cents per share, one year ago.

MAI Basic Four, Inc. announced revenue for the third quarter ended June 30 of $112.3, compared with $79.1 million last year. Net income for the third quarter of both years amounted to $6.8 million, and earnings per share amounted to 45 cents for each period.

How Would You Deal With These Problems?



① The CEO wants a completely overhauled customer information system in 9 months.

② marketing needs external research information in their database to keep ahead of the competition.

③ Accounting needs changes to the old system by the next close.

ORDERS & CONTRACTS

Dataguard Recovery Services, Inc. in Louisville, Ky., signed a $3.1 million contract with **Honeywell Bull, Inc.** for a DPS 8000/82 mainframe computer and 16 MSU3380 storage subsystems. Dataguard will use the equipment to enhance the disaster recovery services it offers on a direct basis to users of Honeywell Bull's large-scale computers.

SHL Systemhouse, Inc. announced that its Arlington, Va., subsidiary has been awarded a computer services contract by the **U.S. Department of the Treasury** valued at approximately $5.5 million.

The contract calls for Systemhouse to provide support services to the Treasury Payroll Information System, which supports approximately 55,000 government employee accounts. Systemhouse will provide computer resources to process payroll data and produce management reports at the company's data center in Johnstown, Pa.

General Datacomm Industries, Inc. announced that **Mercury Communications**, a UK-based national and international telecommunications carrier, has placed an order for General Datacomm Megaswitch networking multiplexers to expand the range of products and services that Mercury can now offer its customers. The order, which extends over 10 months, has a value of approximately $8.5 million and is the largest single multiplexer order in General Datacomm's history.

VM Software, Inc. announced a master software license acquisition agreement with the **Office of General Services of the State of New York.**

The agreement will provide an ordering mechanism for New York state agencies, departments and commissions, referencing uniform prices, terms and conditions for the purchase and maintenance of VM Software products. The contract eliminates the need for each individual agency to conduct an extensive legal review of VM Software licenses. VM Software's VMcenter II and other products are included in the acquisition agreement.

Automatic Data Processing, Inc. (ADP) announced that **Amerifederal Savings Bank** in Lawrenceville, N.J., has signed a five-year contract to use ADP's Houston-based Banking and Thrift Services Division data processing services.

Sorbus, Inc. announced it has entered into an agreement with **Temple University** to provide the university with single-source computer maintenance services. Under the agreement, Sorbus will service the university's IBM 4300 and 3081 mainframes and microcomputers. Sorbus will also maintain a range of Digital Equipment Corp. equipment as the university acquires it. In addition, Sorbus will perform facilities management functions.

Unisys Corp. announced that its Defense Systems unit has been awarded a competitive contract for $55 million by the **U.S. Postal Service** for 18,000 Integrated Retail Terminals (IRT) and multiyear maintenance support based on the Unisys Series 2000 Postal Window Workstation.

Unisys has already installed 7,500 IRT units for the Postal Service as part of a 1987 contract. The new fixed-price contract contains an option for an additional 13,000 IRT units. The complete contract, including all options, is valued at nearly $85 million. Initial deliveries are set to begin in the fourth quarter.

Management Science America, Inc. has been selected by the **Auditor of the State of Indiana** to provide the software and support needed to meet the state's financial and human resource requirements. The new accounting and management control system will serve the auditor's office, the budget agency, the board of accounts, the attorney general's office and the department of administration.

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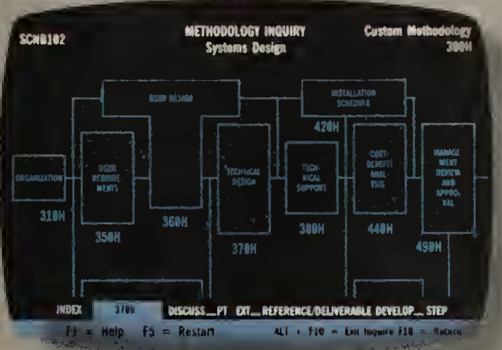

DESIGN/1™ for system design.
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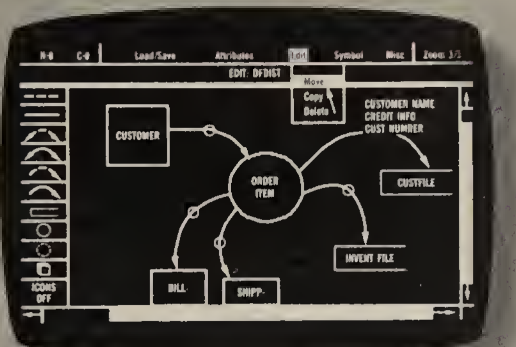

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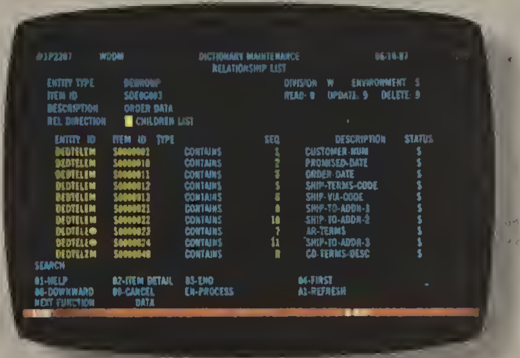

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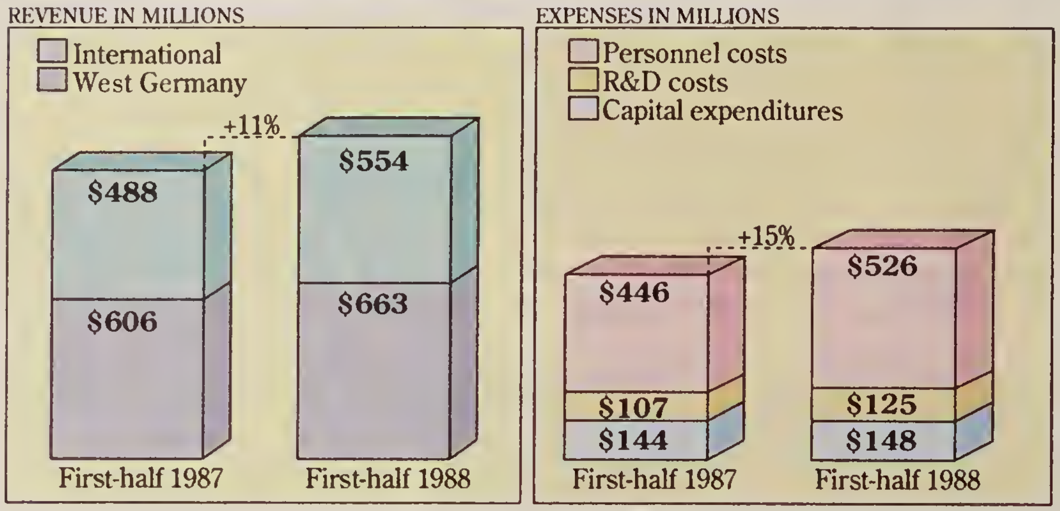
Teutonic struggle

Nixdorf's revenue growth lagged behind its expense increase in the first half of 1988



SOURCE: NIXDORF COMPUTER

Nixdorf CEO keeps chin up despite drop in firm's growth

BY ULF J. FROITZHEIM
IDG NEWS SERVICE

MUNICH, West Germany — Times are tough for West Germany's Nixdorf Computer AG, with slower revenue growth resulting in disappointing profits. Despite these problems, however, Klaus Luft, Nixdorf's chief executive officer, remains optimistic.

"We are gathering our forces," he said in an interview last month. "In the next five years, we are going to double our revenue, as planned, to 10 billion marks," which is $5.2 billion in U.S. dollars.

The company reported $1.2 billion in total revenue for the first half of 1988, compared with $1.09 billion for the corresponding period last year. Revenue from the West German market totaled $663 million, compared with $606 million for the first half of 1987 (see chart).

The company has been pampered for years by supportive press coverage, but Luft is now trying to fight the tides of public opinion, which have started to turn against Nixdorf. West German financial magazines ***Wirtschaftswoche*** and ***Manager Magazin*** are taking a closer look at Nixdorf, with particular scrutiny on the company's poor return on revenue.

"I'm not happy with the current earnings," Luft admitted. However, Luft would not say just how slim the profit margins have become. Profit figures will not be revealed until the company's annual report is released at the beginning of next year.

However, Nixdorf's first-half 1988 results revealed figures that hardly promise rapid improvement in profit. In West Germany, for example, the company's annual revenue is currently only growing by 9% — no longer at a double-digit rate. Company personnel costs have grown unusually fast, with an 18% increase compared with last year's overhead of almost $526 million.

While capital expenditures rose only 3% to $148 million, research and development costs increased 16% to $125 million. According to Sven Kado, Nixdorf's finance director, the company will have to fight hard just to maintain 1987's profit level.

For some time now, Nixdorf managers have reportedly been booking certain sales in advance to boost financial accounts.

Computers that are currently being rented by end users and belong to Nixdorf are being sold by the company to outside firms. Then, Nixdorf leases the machines back again in order to rent them out to end users.

The payoff is this: Money from the rentals, which otherwise would have been recorded in the upcoming year, appears in the current year's financial report as revenue from sales, although the rented machines never actually changed hands. And the leasing firms have no contract with customers; Nixdorf is still responsible for end-user servicing, as before.

According to the company, Nixdorf has already sold products worth $646 million in West Germany to outside companies for re-rental purposes. Inventory at the end of last year still included equipment worth $316 million, and outstanding revenue amounted to about $211 million.

According to Nixdorf, it is "common practice to sell computer systems that have already been rented or leased to customers to unconsolidated subsidiaries or outside companies."

Even without selling rented equipment, "there are ways of converting long-term rental contracts into immediate revenue and profit for the company's financial report."

"Obviously, these people never considered the advantages of incorporating planned rentals into their capital equipment acquisition strategy."

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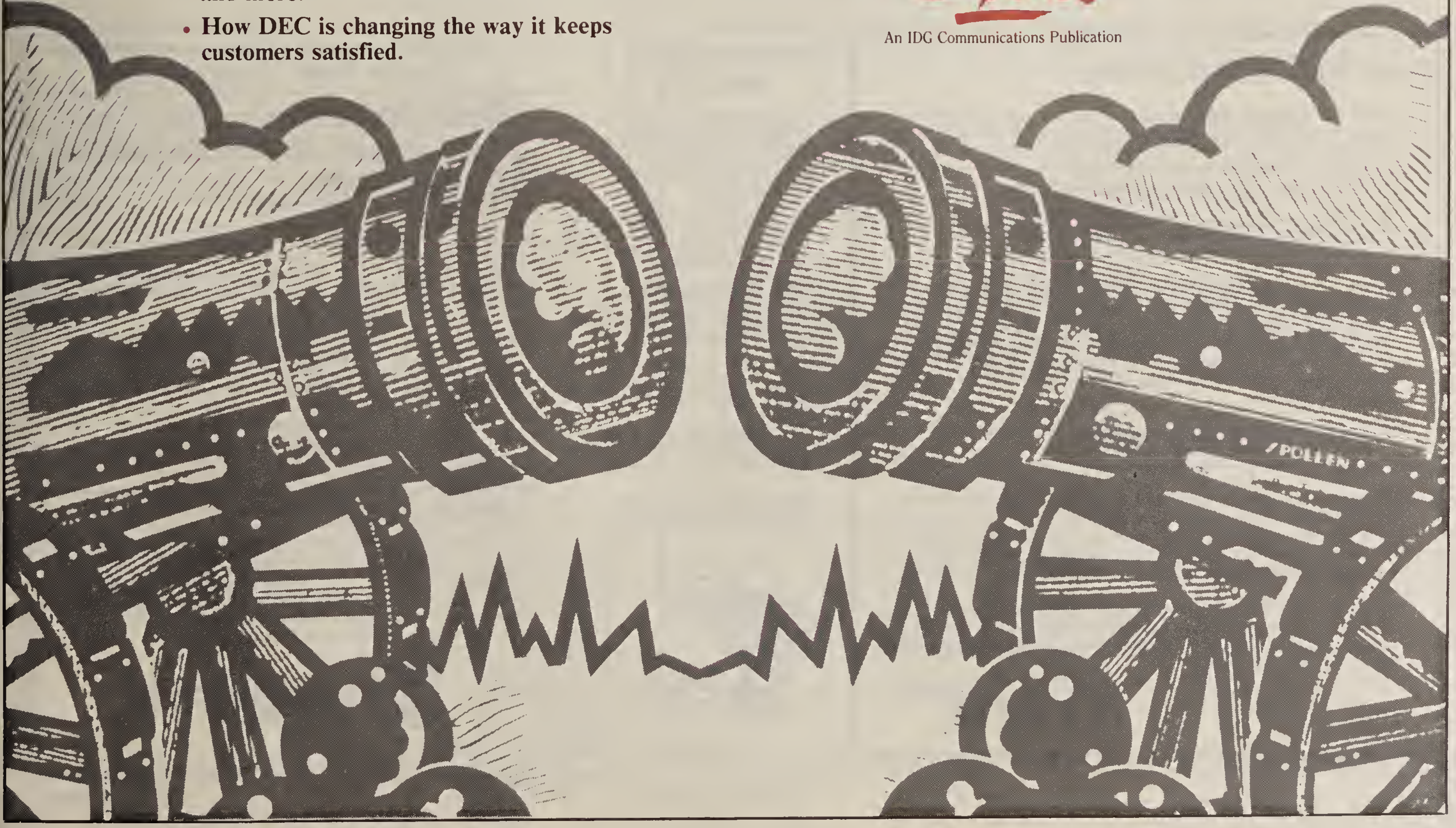


Cost control sparks utilities

Tight-fisted companies launch new technologies but want justification

BY DAVID A. LUDLUM
CW STAFF

The times are changing for the utility industry. In past years, MIS jobs at power companies and other utilities have been generally viewed as stable, routine and mundane, with well-paid and securely employed information systems professionals grunting out third-generation systems.

To some extent, that picture is still accurate. But with mergers among power companies and talk of partial deregulation of the industry, utilities are intensifying a traditional cost-consciousness.

This trend can be a boon to MIS as companies cut costs with innovative technologies such as electronic data interchange, online meter reading, geographical information systems and dashboard terminals for service crews.

But the trend is a double-edged sword. MIS is not exempt from the budget cutting, and jobs in the field have been eliminated. Hiring is slow.

One traditional aspect of utility MIS jobs lives on: the healthy pay. A survey conducted this year by *Computerworld* and the Data Processing Management Association found utilities generally paying the highest salaries among seven industries for 20 information systems job titles (see chart). A survey conducted by the Administrative Management Society generated similar results.

An individual might not necessarily earn more by working for a utility, however. Companies in the industry tend to pay well in part because their slow-but-steady growth gives them a lot of experienced, longtime employees.

But consultants and recruiters say jobs at utilities can bring disproportionately good pay because regulators accept salary costs when reviewing rates.

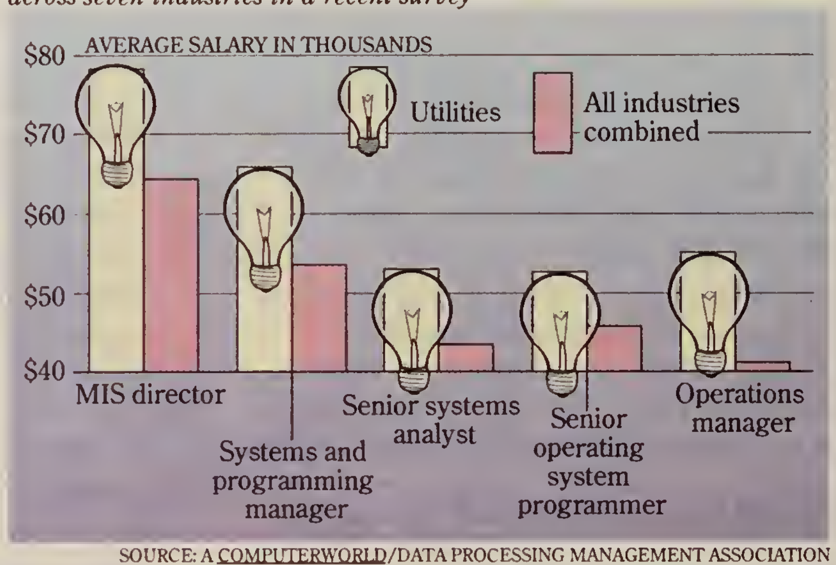
John Connell, executive director of the Office Technology Research Center in Pasadena, Calif., says premium pay has made utility jobs much coveted — particularly in MIS, where the nature of the business is less confining than in areas such as marketing.

Narrow paths

There is a flip side to the industry's character, however. The slow growth can limit career paths within a company. But this drawback can also contribute to premium pay as utilities slap "golden handcuffs" on employees to keep them happy, says Robert Glass, vice-president of planning at recruiter Robert Half International, Inc. in San Francisco. "After six to 10 years, not only are you earning more than market rates, but you get so specialized that it's very difficult to change industries," he adds.

Power pay

MIS professionals at utilities earn the highest pay in salary and additional compensation for 20 of the 26 positions examined across seven industries in a recent survey



SOURCE: A COMPUTERWORLD/DATA PROCESSING MANAGEMENT ASSOCIATION 1988 SALARY SURVEY: AMY J. SWANSON
CW CHART

Finally, utilities might pay MIS workers relatively high salaries because information systems are crucial to the business, consultants say. This was true when automated billing systems were installed and continues as many utilities pursue the new technologies in communications, graphics and other areas.

No longer stodgy

Dennis Fishback, director of technical services at Virginia Power, says the utility industry's traditional stodgy image is no longer the norm, as companies strive to provide good service while reducing costs.

Both Fishback and Gordon Griffith, director of corporate budget and financial planning systems at Montana Power Co., say the key to success is using automation to cut expenses, including personnel costs.

In the past, Virginia Power employees whose jobs were automated were generally reassigned, but this is no longer a viable option, according to Fishback. He says automation has led to the loss of some MIS operations jobs and that hiring for MIS is confined to entry-level people.

A trend toward "lean and mean" recently led to the early retirement of 180 Montana Power employees, about 10 of them in MIS, Griffith says. "As far as hiring, we're not," he adds.

The right stuff

With new technologies and tighter cost constraints — plus the spread of end-user computing — what MIS recruits there are in the utility industry and employees already on board are expected to demonstrate greater sophistication.

Computer operators increasingly are expected to have a college degree. At Montana Power, a trend toward purchase rather than in-house development of large systems requires programmers who can code in a very structured environment, Griffith says.

At Virginia Power, MIS employees are expected to balance their technical knowledge with business acumen, according to Fishback. An emphasis on cost justification makes financial analysis skills particularly important, he says. Management encourages the pursuit of advanced degrees such as MBAs and will pay full tuition.

Ludlum is a *Computerworld* senior writer.

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Position is based in **Chicago**. To qualify, you should have a high level knowledge and experience with UNIX™. Real-time or relational database experience helpful.

All positions require a BSCS or other applicable BS degree. In addition, excellent presentation and technical proposal writing skills are essential.

Harris offers an excellent compensation/benefits package and relocation assistance. For immediate, confidential consideration, please forward your resume, including salary history, to: Nancy May, Harris Computer Systems Division, Dept. CW/0912, 2101 W. Cypress Creek Road, Ft. Lauderdale, FL 33309-1892. We are an equal opportunity employer M/F/H/V.

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HARRIS

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- **Operations Support**
- **Systems Analyst**
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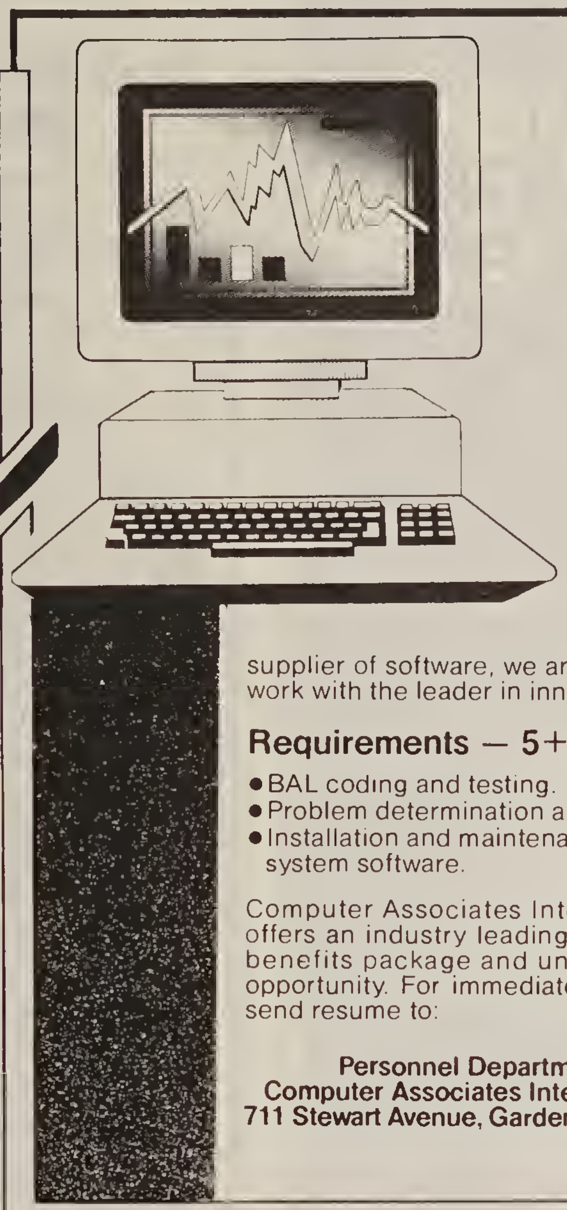

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- TELON
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Programmer analyst positions require 3 or more years experience in financial programming applications utilizing VSAM, COBOL, MVS, CICS or ADS/O with background in payroll/personnel systems. Experience in IDMS, PANVALET, structural coding, SYSD, UCC/1 and other financial systems such as general ledger, accounts payable/receivables a plus.

Northrop provides highly competitive starting salaries and comprehensive benefits coverage. Forward resume with salary requirements to: Professional Staffing Dept. C20, Northrop Corporation, Defense Systems Division, 600 Hicks Road, Rolling Meadows, IL 60008. An equal opportunity employer M/F/V/H. U.S. citizenship required for certain positions.

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For immediate and confidential consideration submit your resume with salary history to: Signet Management Recruitment, Dept. CW, P.O. Box 25970, Richmond, VA 23260.

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Other positions are available in: CT, MA, MD, ME, MN, NH, NJ, NY, IL, PA, RI.

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- PC PROGRAMMERS
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MARTIN MARIETTA DATA SYSTEMS

DISCOVER PROFESSIONAL CHALLENGE AND PERSONAL REWARD

Martin Marietta Data Systems has earned quite a name for itself over the past several years, due to our commitment to advance the technologies utilized in the data processing industry. Discover the professional challenges the following opportunities can offer:

PROGRAMMER/ANALYSTS: We are currently seeking Programmer/Analysts with the following experience:

- 5+ years of IMS DB/DC design and programming in a manufacturing applications environment; MACPAC experience helpful.
- 3+ years experience with DEC VAX hardware and COBOL under VMS or IMS in a manufacturing applications environment is required. COMETS experience is strongly desired.
- 5+ years experience in micro business applications design and programming. Must be proficient in 'C' with capability to program at the micro board level. Should possess in-depth knowledge of PC & MS DOS operating environments and familiarity of VAX-VMS operating system. Also, 4th GL experience is helpful.
- One or more years experience in COBOL, micro and manufacturing applications experience preferred. This position is located in Ocala, Florida.

SYSTEMS PROGRAMMERS: We are seeking IBM Systems Programmers with the following experience:

- 3+ years systems software installation and maintenance using MVS/XA or VM/XA. Excellent Assembler skills required.
- 7+ years experience which includes a working knowledge of MVS/XA, MVS Utilities, SAS, RACF, JCL, TSO, and SPF. Familiarity with PC's TPNS, IMS and statistical analysis methods is helpful.
- 5+ years systems support in a VM environment with working knowledge of REXX and VM/CMS. Experience with MVS, JES2, ISPF, TMS, RACF, SMP/E, DFDSS, FORTRAN, PL/1, and ASSEMBLER-H preferred.
- 7+ years of VAX 785/750 systems programming experience with VAX-VMS, system services, FORTRAN and ability to maintain system performance level and procedures.

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DATA BASE ADMINISTRATOR: Must possess a minimum of 3 years data management experience which includes an in-depth knowledge of JCL and a working knowledge of MVS/XA, VM/CMS and SAS. RACF, VTAM, TMS, HSM, FDR, ASM2, DFDSS, Assembler, PL/1, FORTRAN, and EASYTRIEVE skills desirable.

DATA SECURITY SPECIALIST: Requires 5+ years data security and related controls experience in IBM mainframe, micro and network environments. Must possess a working knowledge of Assembler, RACF, MVS and VM operating systems.

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We are searching for systems programmers with 7-10 years current experience in systems internals with in-depth knowledge of MVS, VM, CICS, IMS, TSO or VSE. Must have a detailed working knowledge of SMF, RMF, CICS/CMF, PERFORMANCE MGMT, CAPACITY MGMT, MODELING OR CHARGEBACK. Applicants should have experience in designing, coding, and documenting programs using a high level language. SAS, PL/1, Assembler or ISPF/DM is a plus.

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- **Operating Systems Manager**
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- **VM Developer**
- **CAP/MMG Developer**
- **Customer Support**

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REQUIREMENTS: 1-5 years of hands-on experience programming using PL/1, IBM OS/MVS. Knowledge of JCL, CICS and VSAM would be a definite plus.

Please submit your resume in complete confidence to: **INFORMATION RESOURCES, INC., Attn: Human Resources Dept. JG/PA4, 150 North Clinton, Chicago, IL 60606.** An Equal Opportunity Employer.

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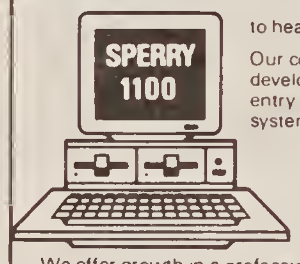
Growth-oriented, 50-year old national industrial distributor seeks an Applications Programmer Analyst to head up our Order Entry group



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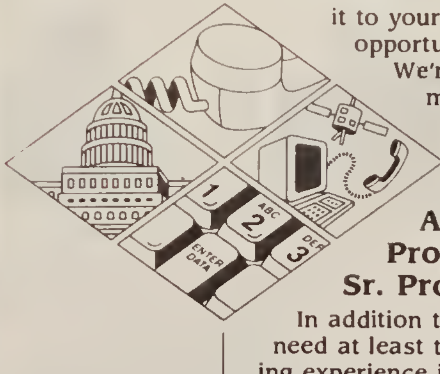

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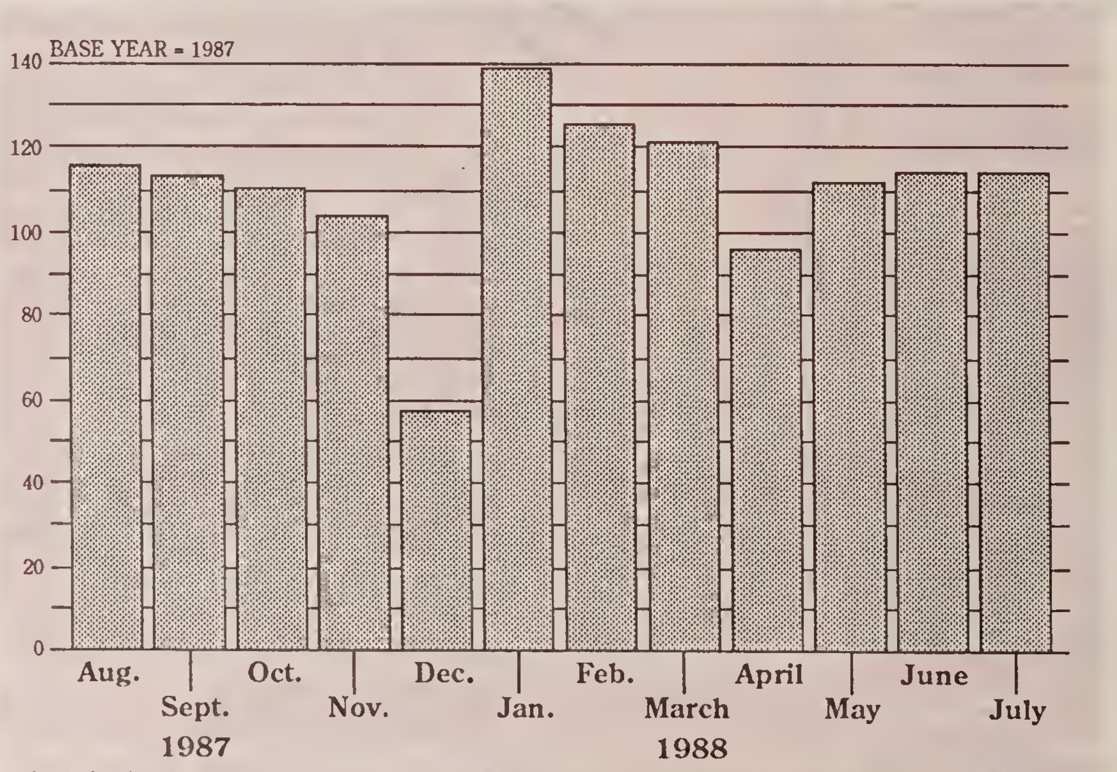

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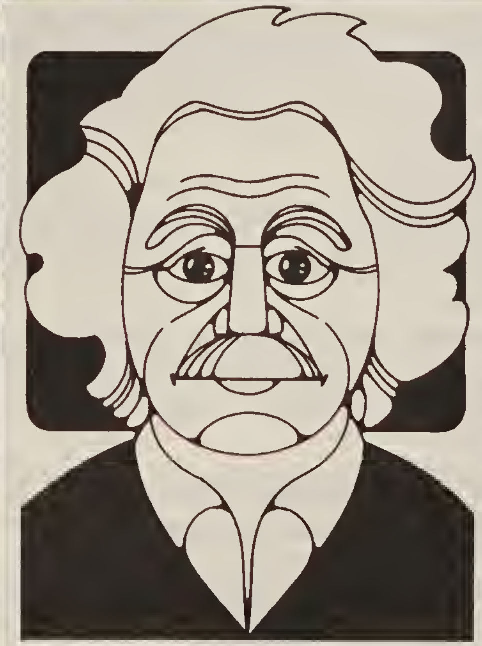

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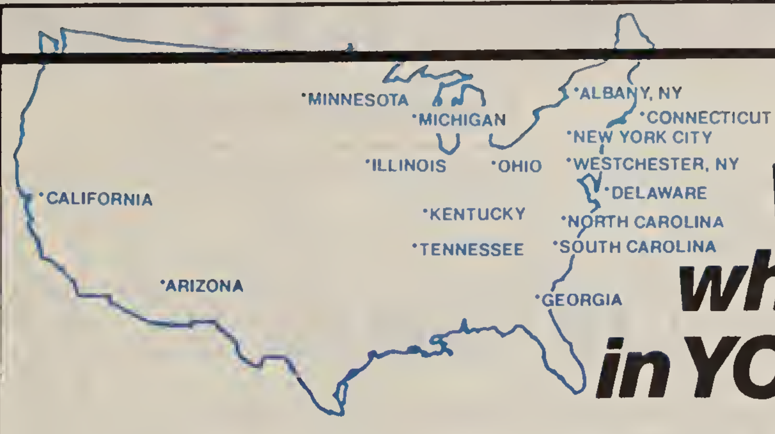

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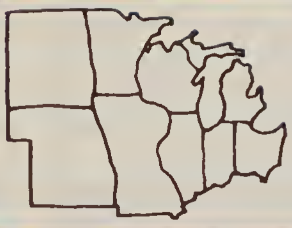

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MARKETPLACE

IBM terminal picture fluctuates

The 3179 and 3180 have their ups and downs on the used marketplace

BY LUCINDA SANTISARIO
IDC FINANCIAL SERVICES CORP.

In the first three months of this year, the IBM 3179 Model 1 color display station dropped 19% in used market value. In the second quarter, this trend continued, and the Model 1 fell 17%. This loss was a result of large leases expiring and end users migrating to the IBM 3192 Models C and F replacement displays.

Recent market trends and third-party market information indicate that the 3179 Model 1 has increased in value by 23% during the third quarter. On April 28, IBM quietly withdrew these terminals from the market. Therefore, end users loyal to this 4-year-old terminal have no alternative but to obtain the Model 1 from the used market, thus drying up the supply and increasing its used value. The Model 1 is currently trading for 36% ($750) retail and 26% ($550) wholesale.

Unlike the 3179 Model 1, the IBM 3180 Models 100 and 110 have continued to drop during the past three months. Since the beginning of the third quarter, these models have declined $100 in used price. This figure represents approximately a 26% decline in the three-month period.

The drop in used value stems from a continued displacement of 3180 Model 100 and 110 terminals onto the secondary market. End users are still dumping these monochrome displays in favor of the 3192 Model D replacement or are opting to move up to the 3192 color terminals. In addition, large three-year leases are expiring, and third-party market dealers continue to bid aggressively to move these boxes.

The 3180 was withdrawn on April 5. It is interesting to note that the withdrawal of this machine has had the opposite effect of the withdrawal of the 3179 Model 1 in regard to used market value. The 3180 Models 100 and 110 are currently trading for $330 retail and $125 wholesale.

On June 28, IBM announced a special trade-in offer for those customers who have signed a Volume Procurement Amendment for IBM workstations. IBM is currently offering its customers $125 for the older 3277, 3278 and 3279 display stations when replaced with a 3191 or 3192 display on a one-for-one basis.

This trade-in offer can be viewed as an effort to entice customers to move, once and for all, into IBM's newest display station line. The $125 take-out offer is at least $75 more than any third-party market dealer would give for these models, some of which are more than 10 years old. IBM has offered a trade-in allowance of $50 on non-IBM 3270-compatible display stations as well.

Reports from the third-party marketplace still indicate that the supply of used 3191 monochrome displays is scarce. The 3191 A10 and B10 models are reportedly the most popular within the 3191 family. Most end users prefer the 122-key typewriter keyboard, which is standard on these models, because it offers the numeric keypad on the side.

For more information, contact IDC Financial Services Corp.'s Terri LeBlanc at 617-872-8200.

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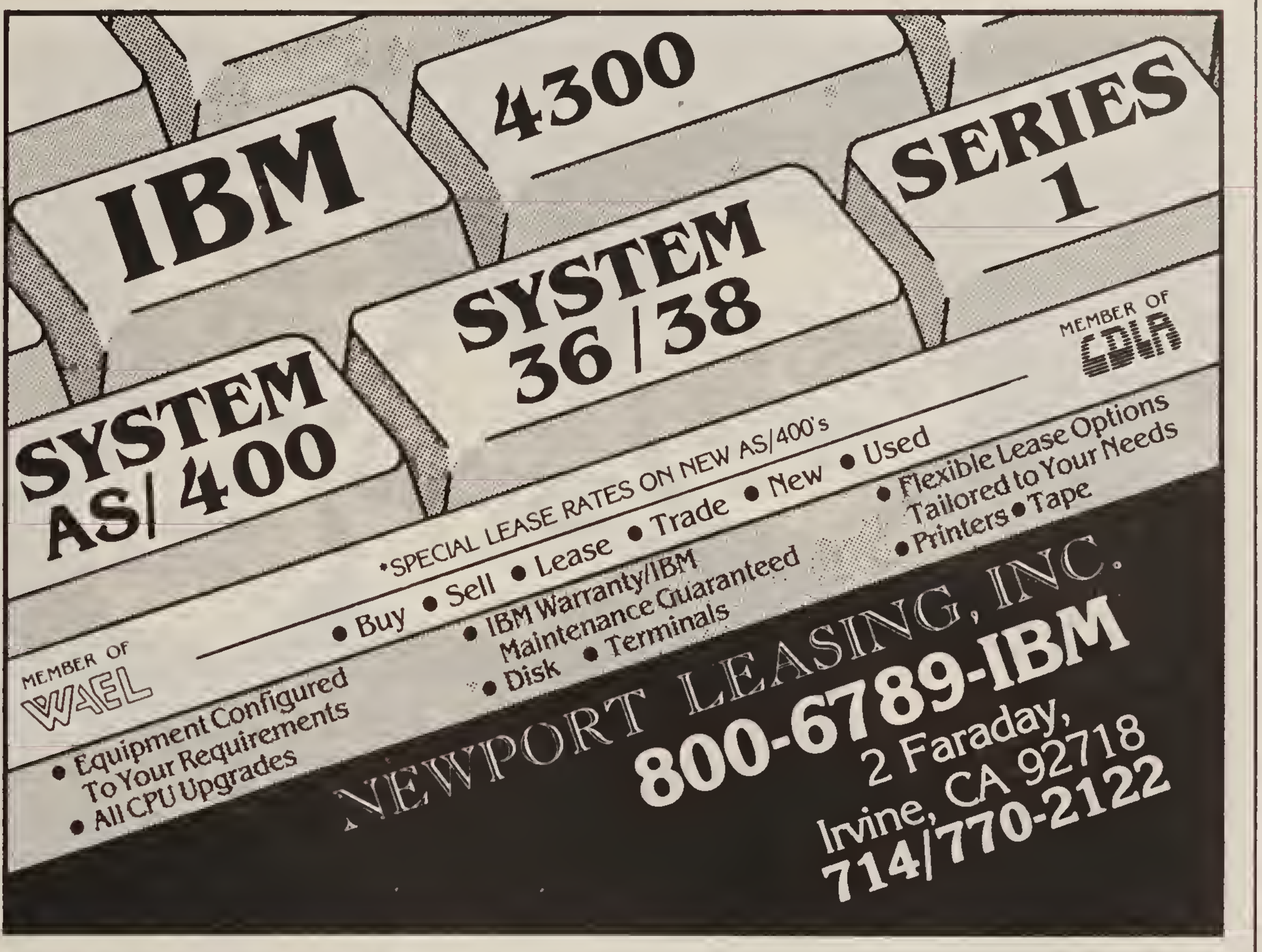

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TRAINING

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Almost unnoticed, training services live on at some network operations

BY KEVIN BURDEN
CW STAFF

The people at the National Association of Securities Dealers (NASD) conduct their computer-based testing the old-fashioned way: They dial it up.

Dial-up computer-based training (CBT) and testing, a vestige of the time-sharing era of computing, is all but forgotten in the age of 20-MHz personal computers with razzle-dazzle graphics. Indeed, more than one data processing trainer contacted recently professed to have no knowledge of dial-up CBT.

But commercial, on-line programs, functioning somewhat like on-line database retrieval, are still offered over commercial teleprocessing networks by at least two vendors: GE Information Services, a division of General Electric Co.; and Control Data Corp.

GE Information Services operates GE Tutor, which carries courses on a variety of subjects including programming languages, basics of IBM hardware and software and the operation of GE applications.

Currently, the company does not market GE Tutor as an individual service but instead offers it to clients of its consulting practice.

CDC operates a similar service called Plato, which NASD used last year for testing in its certification process.

Slowly replaced

Dial-up CBT has faded from the scene since the 1960s, as first in-house centralized systems and then microcomputer-based ones offered most users more attractive options.

In-house systems provide greater control, avoiding reliance on telephone lines and allowing users to customize not only the training curriculum but also individual courses. For large-scale users, they also tend to lower costs.

Microcomputers add high-resolution graphics to the CBT recipe. But despite the popularity of PCs, centralized systems, whether in-house or on-line, still offer advantages. Again, control is a factor, particularly the ability to ensure consistency in courses and monitor and evaluate students' work.

"One of the attractive aspects about central systems is the administrative capabilities that they provide, particularly to larger organizations which have multiple locations but need central record keeping," says David LePage, general manager of CDC's education support services.

> "ONE OF the attractive aspects about central systems is the administrative capabilities that they provide."
>
> DAVID LEPAGE
> CDC

This capability lends itself to testing applications, as demonstrated by the NASD's use of Plato, LePage says.

"We have customers that want to consolidate and control their testing environment. We consolidate [results] and can deliver them to the NASD for further analysis," he says.

Dial-up CBT can have advantages over in-house mainframe systems, too. Naturally, users do not have to buy dedicated processors and training software; GE Tutor can be run on a PC with IBM 3270 emulation.

"Customers who don't want to tie up their capital equipment or their micros may elect to rent the necessary fixtures," LePage says. "Companies have their applications to run without having to allocate time and space on their own hardware."

In addition, users do not have to worry about the compatibility of CBT hardware or software with existing equipment. Finally, users with remote sites to support do not have to concern themselves with special communications lines.

GE's teleprocessing network provides local dial-up access to GE Tutor from more than 650 cities in the U.S., says Dennis Senko, manager of GE Tutor's implementation support. For other areas, there is a toll-free telephone number. Students log on with an access code and an individual registration number.

The cost of dial-up CBT — and whether it is cost-effective — varies depending on how extensively a customer uses it. It might cost $50 for a student to take a one-hour course or $900 to give him unlimited access to any course for a month, including subscription fees and charges for CPU time and the use of telephone lines.

Recognizing the advantages of in-house CBT systems, however, GE also offers them to clients of its consulting practice. "When we look at a client base, we try to offer the delivery vehicle that's best for them and also fits into their budget, whether it is GE Tutor or our micro CBT," Senko says.

LePage sees potential for a revival of centralized systems in general. "First, there was the central system; next came the micros," he says. "Then users wanted to tie the micros together, and that is where the LAN fit in.

"My vision of the market is that next, customers will want to tie their LANs together. That's where we may see some form of the central system again in the future."

Burden is a *Computerworld* assistant researcher.

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"Our ads are intended to garner name recognition as well as generate business. We always like to hear from people who say they saw our ad and want to do business, so it's important to be visible in the marketplace. When potential customers call us with specific needs, we're ready to provide tailored solutions at great savings over new equipment purchases.

"We chose Marketplace because Computerworld *is the leader in its field and has tremendous market penetration, and because of the edge it has in delivering us serious buyers. The new Marketplace section is excellent. Eleven distinct ad categories have their own headings, and that makes it easy for our customers to find us.*

"The results tell the whole story. Now we're advertising only in Computerworld *— we're not even in the Yellow Pages. And Merida will be doing over $1.75 million in business in the next three months."*

Computerworld Marketplace. We're helping more computer professionals buy, sell and lease products and services. We're the exclusive choice of Merida Trading Group. And we can be your choice as well.

For all the facts, call Debbie Eisenberg, *Computerworld* Marketplace Sales Director, at (201) 967-1358.

COMPUTERWORLD
MARKETPLACE PAGES
Where all computer buyers and sellers can go to market.

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ADVERTISERS INDEX

Accelerated Systems Inc.	15
ADR	3
Advanced Computing Environments	77
AI Corp.	20
Alcatel Business Systems	70-71
Amdahl EPS	117
Arthur Andersen	120-121
Attachmate Corp.	56-57
AT&T	12-13,81,94-95
Banyan Systems	76
B.I. Moyle & Associates	16
BMC Software	80
Boole & Babbage	66
BUERK GmbH	105
Bull Peripherals	83
Candle Corporation	50
Cincom Systems	96,97
Cognos	17
Communication Networks '89	67
Compaq Computer	44-45
Computer Associates	33,35,37,39,41
Computer Systems Advisors	112
Cullinet Software	46
CW Campus Recruitment	91
CW Circulation	90
CW Marketplace	103,142
DataEase International	51,53
Data General	29
Data Security Insurance	102
Datasouth	C3
DEC EXTRA	123
Dexpo West	106
Digital Equipment Corp.	26-27
Duquesne Systems	68,78-79
Federal Computer Conference	116
Goal Systems	28
Hewlett Packard	63,65
Hyundai Electronics	30-31
IBM	54-55
IDC	98
Info Tel Corporation	92
Innovation Data Processing	7
Integral Systems	62
Interface Group	64
Interface Systems	25
International Power Machine	93
Invitational Computer Graphics	36
Knowledgeware	86
Leasametric	122
Lotus Development Corp.	59
McCormack & Dodge	C4
McDonnell Douglas	14-15
Metaphor	104-105
Micro Focus	43
Mitron Systems Corp.	82
Must Software	101
NCR	88-89
NEC	113
Netec	103
Network Equipment Technologies/ ComDesign	118-119
Northern Telecom	48-49,84-85
Novell	60-61
On-Line Software	24,90/91
Open Software Foundation	32
Oracle	9
Platinum Technology	23
Plus Development Corp.	74-75
Progress Software	114
Radio Shack	72
Realia	52
Relational Technology Inc.	22
Sage Software	58
SAS Institute	21,69
Software Engineering of America	11
Sybase, Inc.	73
Syncsort	5
TBS Software	119
Televideo	34
Texas Instruments	87,110-111
Toshiba	42
VM Software	36
Wang Information Systems Corp.	10
Westwood Computer	100
Whitesmiths Ltd.	102
Wyse Technology	40
Zenith Data Systems	38
Zitel Corporation	100

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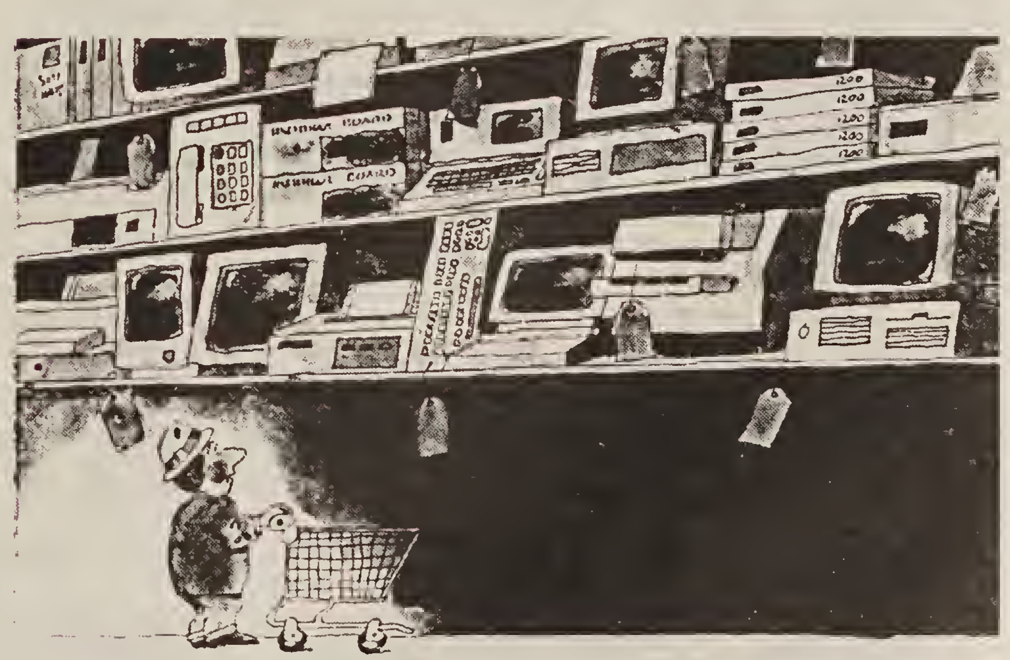

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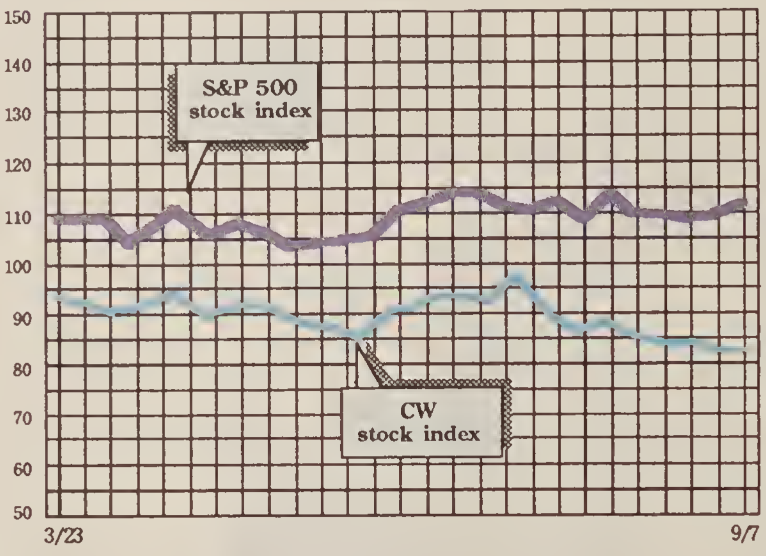
Issue Date	Topic	Ad Closing Date
Oct. 3	Hardware Roundup: Personal Computers and Workstations	Sept. 16
Oct. 17	AI/Expert Systems	Sept. 30
Oct. 31	Unix	Oct. 14
Nov. 14	PC Graphics	Oct. 28
Dec. 5	LAN's	Nov. 18
Dec. 19	IBM-Compatible PCs/PS2 Market Products/Monitors	Dec. 2

STOCK TRADING INDEX



Indexes	*Last Week*	*This Week*
Communications	95.9	**96.5**
Computer Systems	96.2	**94.5**
Software & DP Services	97.0	**96.7**
Semiconductors	59.4	**57.9**
Peripherals & Subsystems	76.9	**78.5**
Leasing Companies	107.1	**108.0**
Composite Index	83.8	**83.6**
S&P 500 Index	110.2	**112.0**

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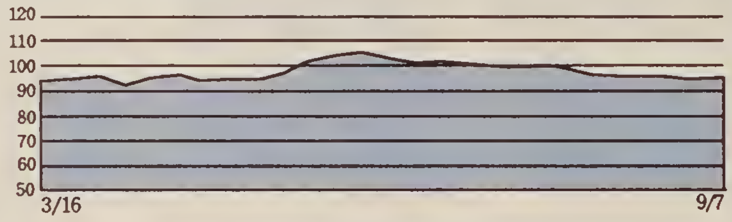

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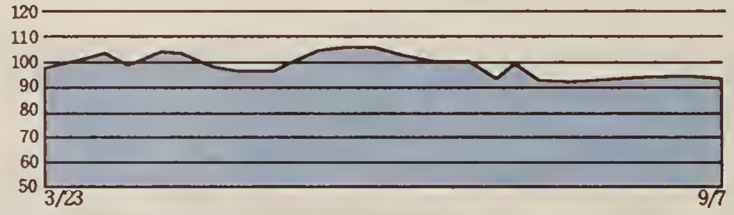

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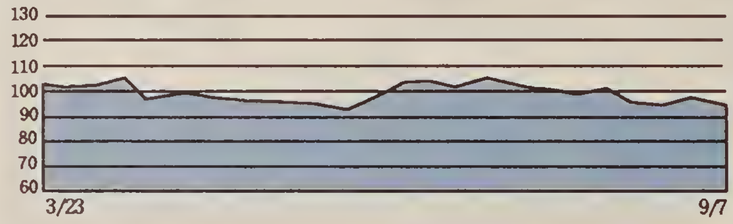

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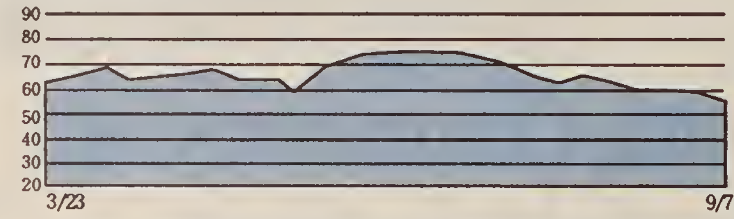

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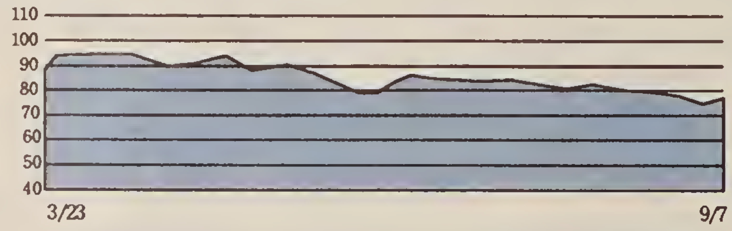
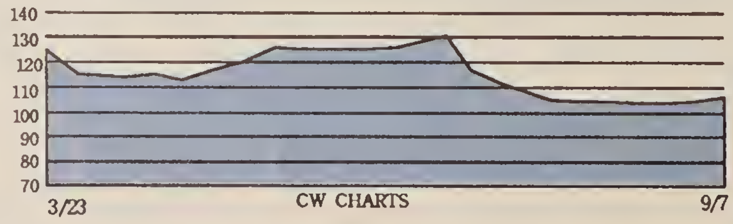


Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 7, 1988

Communications and Network Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT. 7 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	100	74	92.88	2.5	2.8
Q	ANDREW CORP	19	11	16.25	-0.3	-1.5
Q	ARTEL COMM CORP	3	1	2.13	0.1	6.3
N	AT&T	35	20	25.25	0.4	1.5
Q	AVANT GARDE COMP INC	5	1	1.25	0.1	11.1
Q	AVANTEK INC	16	5	5.63	0.0	0.0
N	AYOIN CORP	35	16	22.13	0.0	0.0
N	8ELL ATLANTIC CORP	80	61	70.25	1.5	2.2
N	BELLSOUTH CORP	44	29	40.50	0.8	1.9
Q	COMPRESSION LA8S INC	6	2	3.25	0.1	4.0
O	COMPUTER NETWORK TECH	5	1	1.28	0.0	0.0
O	CONTEL CORP	38	25	35.13	-0.3	-0.7
Q	OATA SWITCH CORP	10	4	6.88	-0.3	-3.5
Q	DIGITAL COMM ASSOC	46	20	21.63	-3.9	-15.2
Q	OYNATECH CORP	31	14	21.50	0.0	0.0
Q	FIBRONICS INTERNATIONAL INC	5	2	3.38	0.0	0.0
Q	GANDALF TECHNOLOGIES	8	5	6.38	-0.1	-1.9
Q	GENERAL OATACOMM INDS	8	3	3.50	0.0	0.0
N	GTE CORP	44	29	41.75	0.6	1.5
Q	INFOTRON SYS CORP	14	5	11.25	0.3	2.3
N	ITT CORP	65	42	49.13	0.8	1.6
N	M A COM INC	16	7	10.00	0.0	0.0
Q	MCI COMMUNICATIONS CORP	18	7	17.75	1.3	7.6
Q	MICOM SYS INC	17	7	15.75	0.1	0.8
Q	NETWORK EQUIPMENT TECH INC	28	12	18.00	-1.0	-5.3
Q	NETWORK SYS CORP	13	7	9.25	0.5	5.7
N	NORTHERN TELECOM LTD	23	14	17.63	0.4	2.2
Q	NOVELL INC	30	12	26.75	-1.0	-3.6
N	NYNEX CORP	78	58	65.00	1.1	1.8
N	PACIFIC TELESIS GROUP	34	23	29.00	0.4	1.3
N	PARAOYNE CORP	8	4	5.25	0.3	5.0
A	PENRIL CORP	5	1	4.38	0.3	6.1
N	PLESSEY PLC	38	23	26.88	-0.6	-2.3
N	SCIENTIFIC ATLANTA INC	18	8	11.88	-0.4	-3.1
N	SOUTHWESTERN 8ELL CORP	46	22	38.75	1.1	3.0
Q	3 COM CORP	26	12	17.38	-0.1	-0.7
N	U S WEST INC	60	43	55.13	0.6	1.1

Computer Systems

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT. 7 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	18	4	4.50	0.0	0.0
Q	ALPHA MICROSYSTEMS	8	3	6.25	0.0	0.0
Q	ALTOS COMPUTER SYS	15	9	8.75	-0.1	-1.4
A	AMDAHL CORP	28	10	18.50	-21.5	-53.8
Q	APOLLO COMPUTER INC	23	9	9.13	0.3	2.8
Q	APPLE COMPUTER INC	60	28	38.25	-1.6	-4.1
N	8OLT 8ERANEK & NEWMAN	25	12	15.75	-0.4	-2.3
Q	8RITTON LEE INC	4	1	2.44	0.0	0.0
N	COMPAQ COMPUTER CORP	79	34	50.75	-1.5	-2.9
Q	COMPUTER AUTOMATION INC	16	4	6.13	-0.5	-7.5
A	COMPUTER CONSOLES INC	9	2	8.38	0.4	4.7
Q	CONCURRENT COMP CORP	21	11	19.63	0.3	1.3
N	CONTROL OATA CORP OEL	38	18	22.63	0.6	2.8
Q	CONVERGENT TECH	8	3	6.06	-0.1	-2.0
Q	CONVEX COMPUTER CORP	15	6	7.13	0.1	1.8
N	CRAY RESH INC	99	47	77.63	-1.3	-1.6
Q	OAISY SYS CORP	.12	5	8.75	-0.1	-1.4
N	DATA GEN CORP	37	16	18.13	0.1	0.7
N	DATAPOINT CORP	9	3	5.00	0.3	5.3
N	DIGITAL EQUIP CORP	200	92	92.25	-0.6	-0.7
N	FLOATING POINT SYS INC	10	3	3.25	0.0	0.0
N	GOULO INC	34	8	22.50	0.0	0.0
N	HARRIS CORP	41	22	26.88	-0.1	-0.5
N	HEWLETT PACKARO CO	74	36	47.13	0.6	1.3
N	HONEYWELL INC	85	49	59.25	0.5	0.9
N	I8M	163	102	111.75	0.3	0.2
Q	INFORMATION INTL INC	16	9	14.25	0.1	0.9
Q	IPL SYS INC	3	1	2.38	0.3	11.8
Q	MASS COMPUTER CORP	14	4	4.50	-0.1	-2.7
N	MATSUSHITA ELEC INDL LTO	230	103	193.00	5.5	2.9
Q	MEGADATA CORP	6	2	2.25	0.0	0.0
Q	MENTOR GRAPHICS CORP	39	14	27.25	-0.5	-1.8
N	N8I INC	12	3	3.38	0.0	0.0
N	NCR CORP	87	50	57.25	1.9	3.4
N	PRIME COMPUTER INC	29	12	12.63	0.3	2.0
Q	PYRAMIO TECHNOLOGY	16	5	11.50	0.0	0.0
Q	STRATUS COMPUTER	35	15	22.88	-1.0	-4.2
Q	SUN MICROSYSTEM INC	44	14	35.88	-2.8	-7.1
Q	SYMBOLICS INC	5	1	1.25	-0.2	-13.1
Q	SEQUENT COMPUTER SYS INC	19	9	17.38	-0.3	-1.4
N	TANDEM COMPUTERS INC	37	12	12.50	-1.1	-8.3
N	TANDY CORP	57	28	41.00	0.5	1.2
N	ULTIMATE CORP	37	9	9.63	-0.4	-3.8
N	UNISYS CORP	47	24	31.00	-1.0	-3.1
A	WANG LA8S INC	19	9	9.00	-0.1	-1.4

Software & DP Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT. 7 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ADVANCEO COMP TECH	6	1	1.38	-0.1	-4.4
N	AGS COMPUTERS INC	30	11	28.50	0.6	2.2
Q	AMERICAN MGMT SYS INC	20	9	12.25	-0.3	-2.0
Q	AMERICAN SOFTWARE INC	16	6	15.13	0.0	0.0
N	ANACOMP INC	12	4	8.00	-0.3	-3.0
Q	ANALYSTS INTL CORP	10	4	8.63	0.1	1.5
Q	ASHTON TATE	33	13	24.25	0.5	2.1
Q	ASK COMPUTER SYS INC	16	6	13.00	0.3	2.0
Q	AUTOOESK INC	34	12	25.25	-1.3	-4.7
N	AUTO OATA PROCESSING	53	16	34.88	-1.4	-3.8
Q	8OOLE & 8A88AGE INC	11	5	10.00	0.1	1.3
N	COMPUTER ASSOC INTL INC	37	15	25.00	0.0	0.0
Q	COMPUTER HORIZONS CORP	14	7	9.75	-0.4	-3.7
N	COMPUTER SCIENCES CORP	73	38	45.25	-0.1	-0.3
N	COMPUTER TASK GROUP INC	16	9	12.50	0.3	2.0
Q	COGNOS INC.	15	4	5.25	0.1	2.4
Q	COMSHARE INC	25	12	21.25	-0.3	-1.2
N	CULLINET SOFTWARE INC	14	4	5.75	0.5	9.5
Q	OUQUESNE SYS INC	22	10	17.00	0.4	2.3
A	OATA ARCHITECTS INC	16	7	13.75	0.0	0.0
N	GENERAL MTRS (CLS E)	51	30	40.00	-0.4	-0.9
Q	HOGAN SYS INC	10	3	4.38	0.0	0.0
Q	INFORMIX CORP	31	8	8.50	-0.5	-5.6
Q	INTELLICORP INC	7	2	3.00	0.4	14.3
Q	KEANE INC	16	6	14.25	0.8	5.6
Q	LOTUS OEV CORP	40	17	17.50	-0.4	-2.1
Q	MANAGEMENT SCI AMER	14	6	8.38	-1.0	-10.7
Q	MICRO PRO INTL CORP	7	2	2.81	0.1	2.3
Q	MICROSOFT CORP	79	37	51.75	1.8	3.5
Q	MORINO ASSOCIATES INC	20	7	13	-0.5	-3.8
Q	NATIONAL DATA CORP	34	20	23.00	0.5	2.2
Q	ON LINE SOFTWARE INTL INC	21	4	4.13	-0.3	-5.7
Q	ORACLE SYS CORP	22	8	18.50	0.0	0.0
N	PANSOPHIC SYS INC	28	11	13.13	-0.1	-0.9
Q	POLICY MGMT SYS CORP	30	15	21.00	-1.3	-5.6
Q	PROGRAMMING & SYS INC	14	7	12.88	-0.1	-1.0
Q	REYNOLOS & REYNOLOS CO	35	14	18.50	-0.3	-1.3
Q	SEI CORP	22	10	18.75	-0.3	-1.3
Q	SHARED MEO SYS CORP	28	15	18.63	-0.6	-3.2
Q	SAGE SOFTWARE INC.	13	5	7.00	0.1	1.8
Q	SOFTWARE PU8G CORP	25	5	20.13	-0.4	-1.8
A	STERLING SOFTWARE INC	11	6	6.63	0.0	0.0
Q	SUNGARO DATA SYS INC	20	10	18.00	0.3	1.4
Q	SYSTEMATICS INC	34	19	32.00	0.0	0.0
N	SYS. SOFT INC.	24	7	22	0.6	3.0
Q	VM SOFTWARE INC	18	7	13.50	-0.8	-5.3

Semiconductors

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT. 7 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADV MICRO DEVICES INC	25	8	11.00	-0.4	-3.3
N	ANALOG OEVICES INC	20	8	11.75	-0.3	-2.1
Q	ANALOGIC CORP	12	5	7.38	0.1	1.7
Q	INTEL CORP	42	18	26.88	-1.1	-4.0
Q	LSI LOGIC CORP	15	7	11.25	-0.5	-4.3
N	MOTOROLA INC	74	35	41.13	-0.9	-2.1
N	NATL SEMICONDUCTOR	22	9	9.00	-0.1	-1.4
N	TEXAS INSTRS INC	80	36	38.75	-2.0	-4.9
A	WESTERN DIGITAL CORP	27	11	14.25	0.6	4.6

Peripherals

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT. 7 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLOY COMP.	13	2	2.88	0.4	15.0
N	AM INTL INC	8	3	5.50	-0.1	-2.2
Q	AST RESH INC	21	6	9.50	-1.1	-10.6
Q	AUTO TROL TECH CORP	6	3	5.13	0.1	2.5
Q	8ANCTEC INC	14	5	8.25	0.0	0.0
Q	CIPHER DATA PROOS INC	12	4	9.13	0.5	5.8
A	COGNITRONICS CORP	4	2	2.88	0.0	0.0
A	DATAPROOUCTS CORP	24	7	10.88	0.0	0.0
A	OATARAM CORP	8	5	7.38	-0.1	-1.7
N	EASTMAN KODAK CO	71	39	43.63	0.6	1.5
Q	E M C CORP MASS	27	4	4.25	-0.3	-5.6
Q	EMULEX CORP	9	4	8.13	0.1	1.6
Q	EVANS & SUTHERLANO	31	14	17.25	-0.3	-1.4
Q	ICOT CORP	8	3	3.13	0.0	0.0
Q	INTERLEAF INC	24	10	10.00	-0.3	-2.4
Q	IOMEGA CORP	5	1	3.13	-0.1	-2.0
Q	LEE DATA CORP	6	3	3.13	0.0	0.0
Q	MASSTOR SYS CORP	5	1	2.44	0.1	2.7
Q	MAXTOR CORP	16	6	6.88	0.1	1.9
Q	MICROPOLIS CORP	35	10	11.00	-0.3	-2.2
Q	MINISCRIBE CORP	17	5	9.50	-0.5	-5.0
N	MINNESOTA MNG & MFG CO	84	45	61.13	0.8	1.2
A	MSI DATA CORP	19	8	10.63	0.5	4.9
Q	PERSONAL COMPUTER PROOUCTS INC.	7	4	5.44	-0.2	-3.3
Q	PRIAM CORP	3	1	1.75	0.3	16.7
Q	PRINTRONIX INC	12	7	10.38	0.3	2.5
N	QMS INC	27	7	7.38	0.1	1.7
Q	QUANTUM CORP	18	8	12.00	0.0	0.0
N	RECOGNITION EQUIP INC	17	6	8.00	-0.6	-7.2
Q	REXON INC	9	4	7.63	-0.1	-1.6
Q	SCAN TRON CORP	17	7	15.50	0.0	0.0
Q	SEAGATE TECHNOLOGY	29	8	9.00	0.0	0.0
N	STORAGE TECH CORP	4	1	2.13	-0.1	-5.6
Q	TANOON CORP	4	1	1.69	-0.1	-3.5
A	TEC INC	6	3	3.13	-0.3	-7.4
N	TEKTRONIX INC	38	21	22.13	-0.1	-0.6
Q	TELEVIDEO SYS INC	3	1	0.94	0.0	0.0
N	XEROX CORP	81	50	54.50	0.6	1.2
Q	XIOEX CORP	14	5	9.00	0.0	0.0

Leasing Companies

EXCH		52-WEEK RANGE (1)		PRICE CLOSE SEPT. 7 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	CAPITAL ASSOCIATES INTERNATIONAL INC	9	4	5.75	-0.4	-6.1
N	COMOISCO INC	37	12	20.13	0.4	1.9
Q	CONTINENTAL INFO SYS	11	4	3.88	0.0	0.0
Q	PHOENIX AMERN INC	5	2	3.13	0.3	8.7
Q	SELECTERM INC	6	3	4.88	0.0	0.0

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL;
O = OVER-THE-COUNTER; S = SPLIT

O-T-C PRICES ARE 8ID PRICES AS OF 3 P.M. OR LAST 8I0
(1) TO NEAREST DOLLAR

No wake

Issues are cruising at 1 mph, barely creating a ripple

Wall Street had a tough time shaking off its drowsiness from the lengthened weekend as the Dow Jones industrial average experienced sluggish trading last week, while computer issues continued to slump. Semiconductor manufacturers were chief among the walking wounded during the three days of trading. Chips and Technologies, Inc. felt the heat after cutting its earnings estimates for the year ending June 1989 and fell 2⅛ points from a week earlier to finish Thursday's close at 11. Chip maker Intel Corp. was also off, slipping 1⅛ points to 26½.

In other action, Compaq Computer Corp. fell 2½ points to 51⅝; Digital Equipment Corp. lost 2⅛ points to 92⅜; IBM was down 1⅞ points to 112⅛; Stratus Computer, Inc. fell 1⅜ points to 22⅝; Sun Microsystems, Inc. slipped one point to 36⅝; Apple Computer, Inc. eased one point to 38¾; and Lotus Development Corp., which hit yet another 52-week low when it traded at 16¾ on Wednesday, finished at 17¾, down ½ a point.

Amdahl Corp.'s 3-for-2 stock-split took effect last week, and the mainframe maker's stock closed Thursday at 19⅛.

JAMES DALY

Tax changes rejected; one-year setback seen

BY DAVID A. LUDLUM
CW STAFF

Large consulting and data processing service firms gained more ground last week in their running battle with independent contractors over tax laws.

Efforts by the independent contractors to revise Section 1706 of the Tax Reform Act of 1986 appeared to suffer at least a one-year setback as a U.S. Senate committee rejected changes to the law.

Instead, the Senate Finance Committee voted to direct the Treasury Department to conduct a year-long study of Section 1706, agreeing with a proposal already passed by the House of Representatives.

Section 1706 has sharply restricted opportunities for technical professionals and consultants to take advantage of federal income tax deductions available to independent contractors.

Joseph Scordato, chairman of the Independent Computer Consultants Association (ICCA), conceded that the Finance Committee was "throwing a bone" to Sen. Daniel P. Moynihan (D-N.Y.), who sponsored Section 1706 but has tried to dilute it in the wake of the uproar it has created among independent contractors.

In July, Moynihan floated a proposal, backed by independent contractor groups, that would loosen the standards that Section 1706 requires independent contractors to meet.

Moynihan sought to have the proposal included in a Senate bill for technical corrections to the tax reform measure. Last Thursday, the Finance Committee approved the study instead.

Scordato expressed concern that the study would "get lost in the woodwork," be inconclusive or fail to include input from independent contractors. "If they had suspended 1706 until the outcome of the study, I would be a lot happier," he added.

But the ICCA will continue the battle, Scordato said. "We're going to intensify our efforts from the grass roots up. It's not something that's going to go away until we get some satisfaction," he said.

"We're obviously pleased," said Mary Jane Saunders, a spokeswoman for ADAPSO, which represents large consulting and DP service firms supporting the current law.

"We sent letters to everyone on the Senate Finance Committee asking them to support the study. We're of course opposed to Senator Moynihan's proposal," Saunders said.

Lotsa bucks

Congress' Joint Committee on Taxation estimated that repealing Section 1706 would cost the government $500 million in a five-year span. Before they are willing to repeal or modify the section, many members of Congress would require an offsetting provision to compensate for the loss of revenue, DeMarcus said.

The Senate Finance Committee approved the study of Section 1706 in a proposed amendment to its bill of technical corrections to the tax code. The committee has already sent the bill to the Senate floor. Members expect to attach the proposed amendment during debate of the bill on the floor.

"Technically, senators can offer [other] amendments to this bill on the floor of the Senate, but I'd be real suprised if Moynihan chose to do it," Saunders said, citing pressures in Congress to avoid controversy and quickly finish business in Washington in light of the presidential campaign.

Moynihan's July proposal would prohibit independent contractors from working for a client for more than 18 months at a time and require them to obtain letters from brokers testifying to their independence. It also would impose 10% income tax withholding on independent contractors.

Turbo token-rings before their time?

Capacity of current LANs unrealized; 100M-bit technology close behind

BY PATRICIA KEEFE
CW STAFF

The installed base of token-ring users is not jumping for joy over the coming 16M-bit speed.

IBM, Proteon, Inc. and 3Com Corp. are all expected to announce 16M-bit token-ring technology before year's end. Nonetheless, most users report that they are plenty satisfied with today's 4M-bit speed, noting that they have yet to fully exploit the current bandwidth.

"We don't anticipate looking at it until we at least get a grip on the 4M-bit LAN for PCs," said Alex Kalpaxis, a manager at Bankers Trust Co. in New York.

"Users are concerned with speed, but when you look at whether they are using what they've got at full capacity, they're not," said Nina Burns, an analyst at Infonetics, Inc. in Santa Clara, Calif.

Moreover, 16M-bit transmission could find itself snubbed on the high end. By the time these products ship, which is expected to be during the first half of 1989, resolution of the emerging Fiber Distributed Data Interface standard for 100M-bit networks will not be far behind.

The arrival of two high-speed options in a somewhat tight time frame is bound to confuse interested users, particularly in cases in which new cable will have to be pulled regardless of the transmission speed chosen.

Middleman

A more immediate casualty of a turbocharged token-ring war might be Westboro, Mass.-based Proteon's nonstandard 10M-bit token-ring. Analysts and dealers said Pronet-10 is not doing well and will fare even worse when users of standard-based 4M-bit token-rings have the option of migrating to even higher-speed, standards-based brethren.

Proteon President Patrick Courtin recently confirmed that Proteon is also working on a 16M-bit LAN.

Token-ring users polled recently by *Computerworld* outlined the following scenarios for 16M-bit applications:

- Campus or organization backbones are the targeted use for many users, including The Travelers Corp. in Hartford, Conn. Another user anticipates using the 16M-bit option as a subbackbone, linking multiple LANs between floors in one building. Departmental LANs with high utilization may be upgraded to 16M bits, Travelers said.
- Niche applications such as high-speed graphics or medical imaging workstations that move large volumes of data need high bandwidth, said Gail James, president of Lanquest Group, Inc.
- IBM wins hands down as the preferred supplier. Although there are other companies that build token-rings, analysts said IBM has cornered 90% of the current market.
- The anticipated price point hovers around $1,000. IBM recently upped the ante 5% on its 4M-bit adapters, which now range from $728 to $939.

Users are not expecting a major price differential because the current 4M-bit technology forms the basis of efforts to boost the token-ring to 16M bits.

Also, users cautioned that cabling will prove more costly than purchasing the turbocharged boards. The real cost in migrating to the 16M-bit network, they said, will be pulling new cable.

Lotus

FROM PAGE 1

about the future of Release 2.01, perhaps the speediest spreadsheet available for XT-class machines. Clearly, Lotus has some enhancing to do to keep low-end users happy.

"We don't want to encourage users to use [Release 3.0] on lower platforms unless there are some features they really need and they don't care as much about the performance," Lotus Vice-President of Marketing Frank Ingari said. "We want to set the right expectations with users."

There is more bad news for users of low-end PCs. Users accustomed to running large models in a 640K-byte machine had better stock up on extra memory, Lotus acknowledged. "Someone committed to getting 400K bytes of worksheet space today and who wants Release 3 needs to think about more memory," Ingari said.

Release 3.0 cannot possibly match the pure performance or worksheet size of today's 1-2-3 for two reasons; it has more features packed in, and it has been rewritten from the speedy assembler to the portable but sluggish C language.

Lotus officials argued that most organizations are shifting to high-end PCs, so the upgrade should be no problem. But users are not so sure.

The dilemma for C. Thomas Hendrix is explaining to his 100 XT users why they cannot upgrade to Release 3.0 while the 350 users of 80286 machines can. "That means I will get more pressure to upgrade the hardware," explained Hendrix, an information center manager at the Aluminum Company of America, or Alcoa. "I guess that's progress."

Richard T. Gump has the same problem at the Dallas-based insurance firm of Brinegar, Jones & Gump — three-quarters of the firm's PCs are XTs. "I am not going to have a product that makes me upgrade all my machines," said Gump, a partner with the firm.

The 80286 requirement for adequate performance prompted speculation about the future of today's 1-2-3 Release 2.01, which Lotus intends to keep on the market.

The key question is, How will Release 2.01 be enhanced? There has been speculation that Lotus was planning a major rewrite of Release 2.01 that would include many of the features of Release 3, except for multidimensional spreadsheets.

'Alive and well'

A month ago, a Lotus source explained that the speculation resulted from a business plan that proposed the notion but had not been approved. Now it appears that the Release 2.01 enhancement plan has gathered steam and has become more concrete in the last month.

"It is alive and well," one Lotus source said. The upgrade will reportedly include the elimination of Print Graph — an awkward way of creating charts — the addition of an Undo command and perhaps print spooling, Search and Replace and new @functions, a Lotus developer source said.

Lotus is not ruling out any possibilities. "When we say we are committed [to Release 2.01], that means spending dollars," Ingari said.

Also in question is how long Lotus can maintain its $495 price on Release 2.01, when Release 3.0 will sell for the same amount. All Ingari would say is that Release 2.01 "is the right product for some machines and offers a lot of value."

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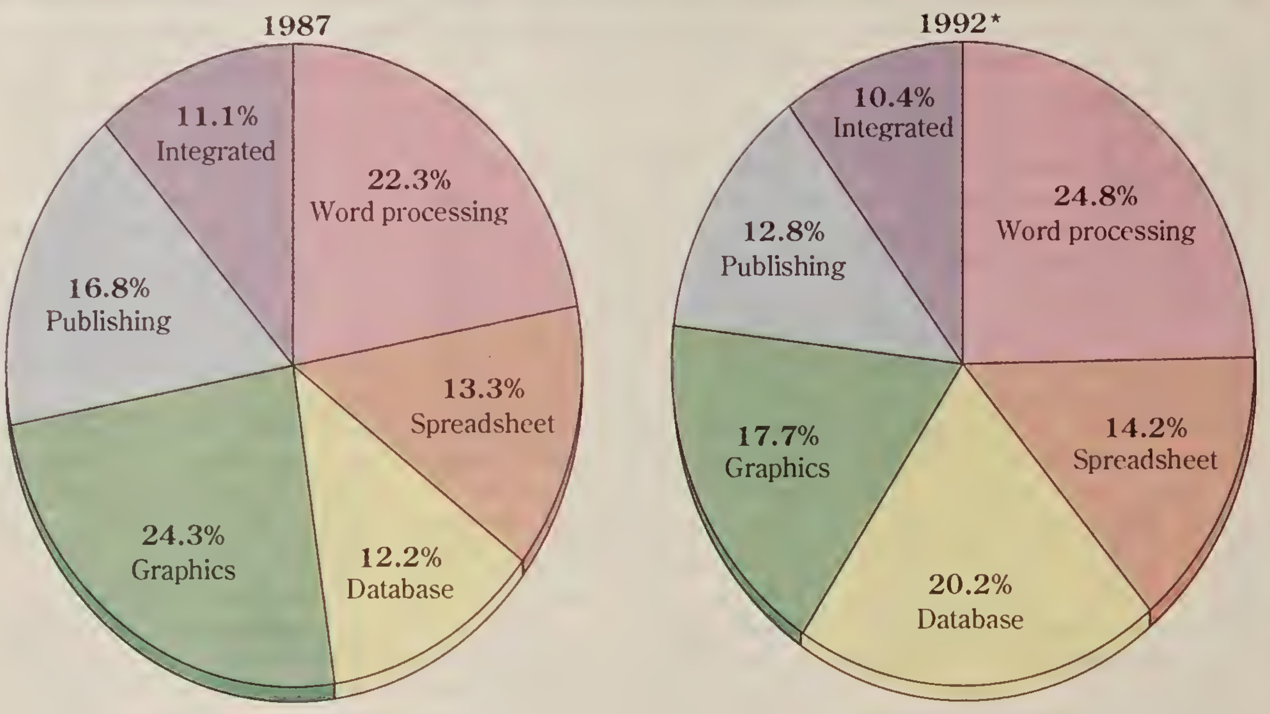
TRENDS

Macintosh software

Databases eating into other applications' slices of the Apple pie

PERCENT MARKET SHARE BY UNIT SHIPMENTS



Total: 1.3 million units shipped

Total: 4 million units shipped

*Projected

Apple Computer, Inc.'s Macintosh is no longer just the personal computer of choice for desktop publishing. Although Apple still holds a leading position in the desktop publishing marketplace, the Macintosh's appeal has broadened.

According to International Data Corp. (IDC), shipments of software for Apple's Mac will triple in the next four years to nearly four million copies in 1992 from 1.3 million in 1987. Sales of database management software for the Mac will increase the most during this period, growing to 20% of all Mac software shipped in 1992 from 12.2% last year, IDC predicts.

The rise in popularity for database management packages reflects the evolution of the Mac from a PC for the home to a sophisticated business tool.

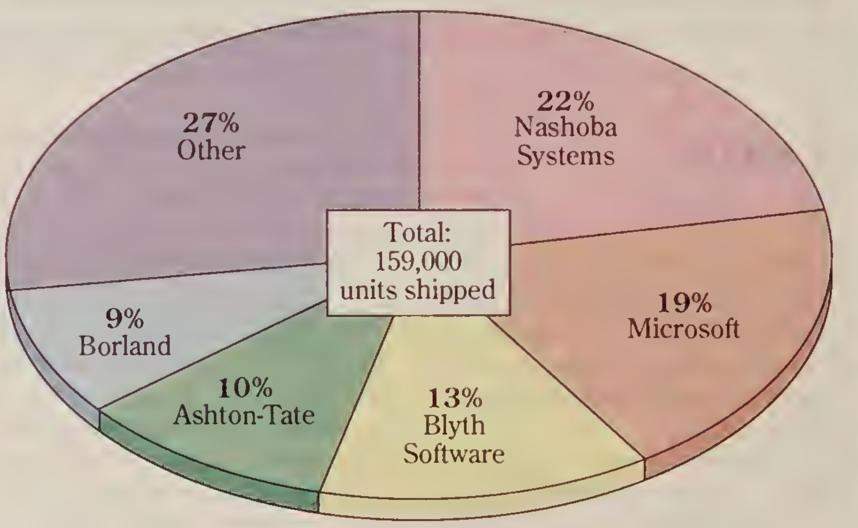
When the Mac first arrived on the scene, it offered only 128K bytes of random-access memory and no expansion slots to augment that. Its limited amount of memory could not accommodate large programs like database managers, and few Mac users required sophisticated applications at the time.

With the introduction of the Mac II last year, Apple finally had a serious business system. The Mac II offers the expansion slots necessary to increase RAM for larger programs. The debut of the Mac II and the business software that has since been introduced has helped Apple walk through the front doors of many Fortune 1,000 companies.

JULIE PITTA

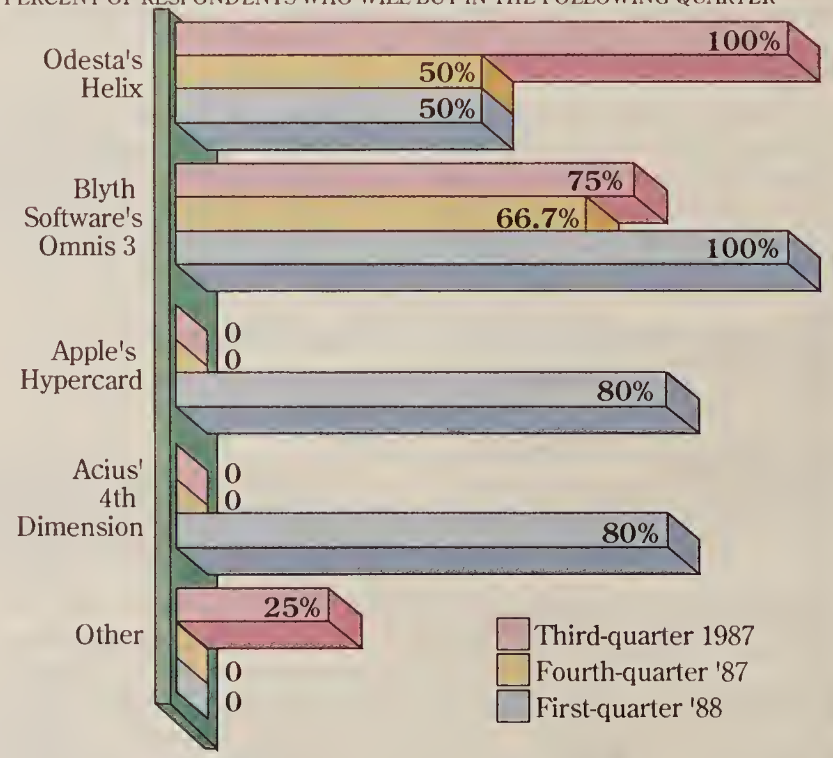
Nashoba holds most of database market

PERCENT MARKET SHARE BY UNIT SHIPMENTS



Each product's user buying plans

PERCENT OF RESPONDENTS WHO WILL BUY IN THE FOLLOWING QUARTER*



*Base of 200; multiple answers allowed

SOURCE: INTERNATIONAL DATA CORP.

INSIDE LINES

Who'll get the message out now? IBM axed an unspecified number of jobs from its marketing communications department late last week. Industry rumors of an impending new wave of executive shifts and employee shifts notwithstanding, the move was "part of the implementation of headquarters consolidation" announced in July, said a company spokeswoman (who still works for IBM). What's more, she said, don't expect this to be the last play of the July game plan. "It's highly unlikely that we would comment on what actions we might take at some future time," the spokeswoman said, "but we'll certainly take steps to do whatever we have to in order to remain competitive."

If at first you don't succeed . . . DEC is likely to take yet another shot at penetrating the desktop market this week, announcing a "personal VAX" based on the Microvax 3000 chip, according to Peter Schay at the Gartner Group. This entry will supersede DEC's last, unsuccessful candidate, the Vaxstation 2000, providing faster processing speeds and possibly MS-DOS emulation — two areas in which the 2000 fell down, Schay said. But other sources indicated that DEC is not yet quite ready to unveil its personal device.

Hitting them where it hurts. Just imagine being able to slap a card into your VAX and hitch it to an IBM Token-Ring network. Better yet, picture the VAX as a Token-Ring file server. The thought may turn Big Blue green, but sources say DEC is hard at work on precisely these scenarios. Considering DEC's often verbalized wish for open networking and its recent penchant for climbing into bed with a host of vendors, including Apple and Compaq, it seems logical enough that DEC not leave IBM out.

Bailing out! Lotus lost another executive last week. This time it was Vincent C. Kelly, former vice-president of North American sales, who jumped ship. Kelly has joined reseller Corporate Software, Inc., where he will serve as vice-president of sales.

Dbase takes on weight. Ashton-Tate is clearly rushing to ship Dbase IV later this month, as promised, but like Lotus, it is having problems squeezing the beast into 640K bytes. Overlays are fine, but what happens if two overlays are needed at the same time? To get the thing off the ground, Ashton-Tate is reportedly trying to hammer out a deal with vendors of memory management software, such as Quarterdeck, to incorporate Expanded Memory Specification support into the product.

Now *this* is Fortune 500 software. On Tuesday, *Fortune* is slated to announce a software package that contains the Fortune 500 list and uses a runtime version of Borland's Paradox for data manipulation. This baby will sell for less that $200 and will, of course, be updated every year.

Bush in a horse race. George Bush will win the 1988 presidential election in a close race with Michael Dukakis. Who says so? The computer — or, more specifically, the computer program says so. A program developed from a model using 12 political factors successfully selected the winner of the popular vote in all 31 presidential contests from 1860 to 1984, according to Source Translation & Optimization, which publishes a directory of computer software available in source code from governments around the world. The irony is that the model was developed by Soviet scientist Vladimir Keilis-Borok, based on data supplied by American historians. Of course, there's a catch: Some of the 12 factors are judgmental. But you can be the judge and pick your own winner: Send a disk and mailer to company President Gregory Aharonian, P.O. Box 404, Belmont, Mass. 02178, and he'll ship you his program.

Now if IBM had been able to bring out products justifying its claims for the Micro Channel Architecture bus, and if Compaq had conceded a year ago that the AT bus could be improved upon, wouldn't the industry be a lot better off? Call the hot line at 800-343-6474 or 508-879-0700 and tell News Editor Pete Bartolik your solution to the bus wars; we'll pass the message along to the combatants.

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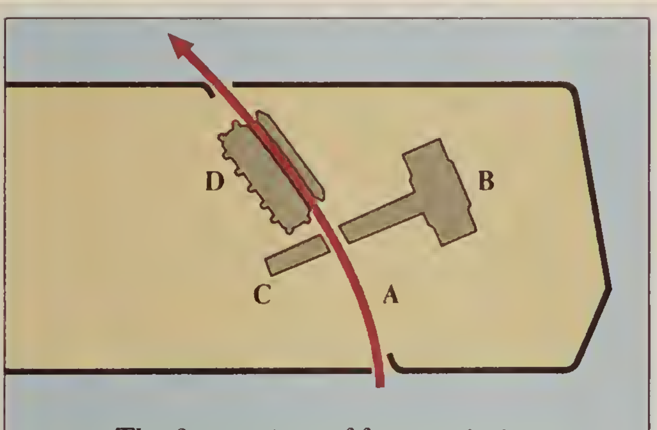

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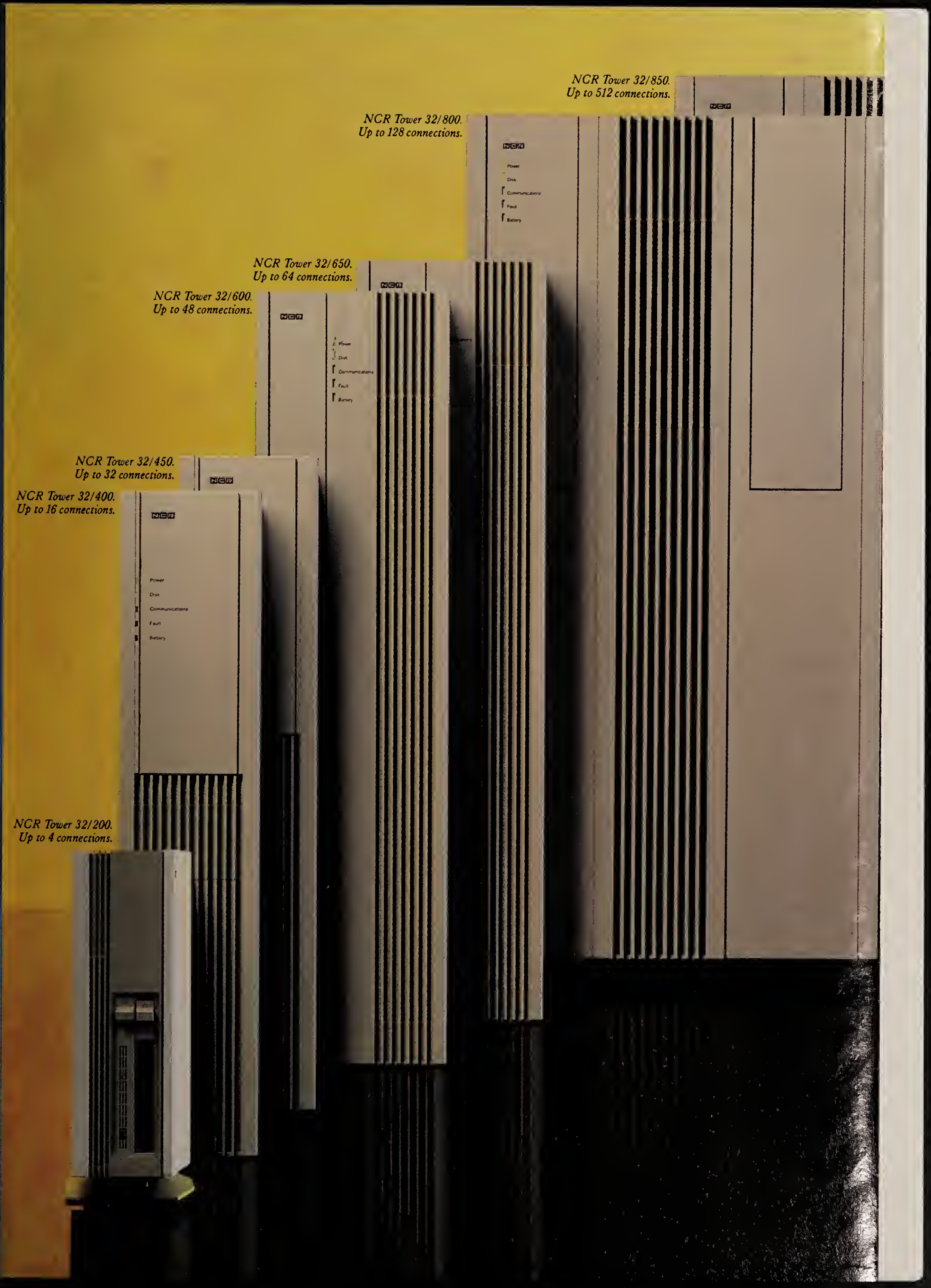

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CONTENTS

LEADERSHIP SHIFTS TO SMALLER FIRMS
By Michael Sullivan-Trainor 6

HOW WE RANKED THE 100 9

VERTICAL MARKET PROFILES

UTILITIES
Northeast Utilities *by Connie Winkler* 18

EQUIPMENT AND MATERIALS MANUFACTURING
Polaroid *by Michael Ball* 22

AEROSPACE, AUTOMOTIVE AND INDUSTRIAL
Northrop *by Glenn Rifkin* 26

INSURANCE AND FINANCIAL SERVICES
The Travelers *by Alan Radding* 30

FOOD AND CONSUMER PRODUCTS
Abbott Laboratories *by Amy Bernstein* 42

TRANSPORTATION AND OTHER SERVICES
McGraw-Hill *by Connie Winkler* 44

CHEMICALS
Dow Chemical *by Michael Sullivan-Trainor* 54

BANKING
Banc One *by Michael Sullivan-Trainor* 60

PETROLEUM PRODUCTS
Amoco *by Amy Bernstein* 68

RETAILING
J. C. Penney *by Connie Winkler* 72

WHERE TO FIND THE 100 77

HOW TO CALCULATE YOUR RANKING 80

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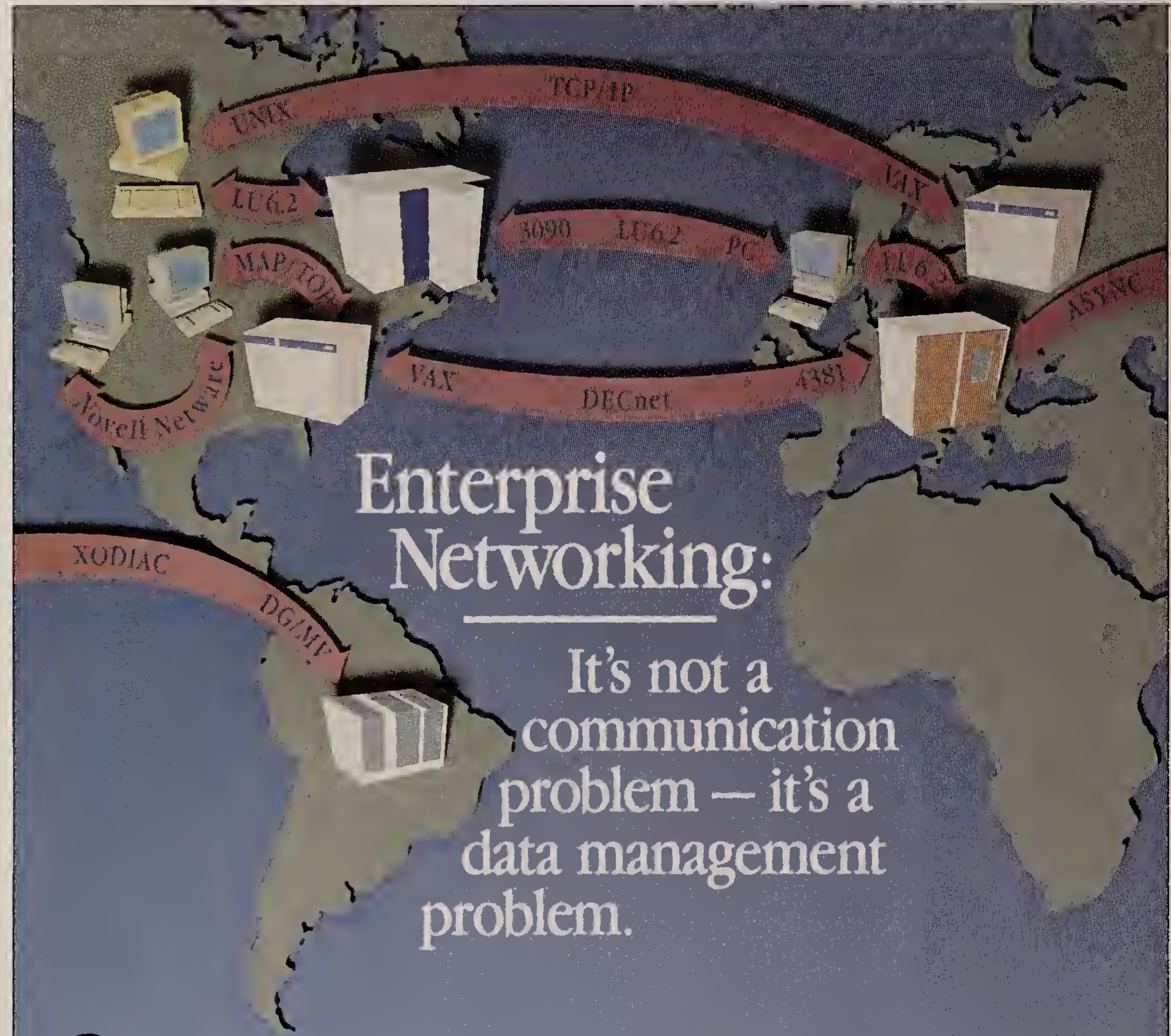

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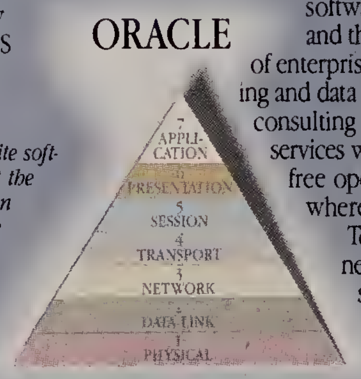

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	Oakland	Oct 6
	Sacramento	Sep 22, Nov 10
	San Diego	Sep 8, Oct 6, Nov 3
	San Francisco	Sep 14, Oct 11, Nov 9
	San Jose	Sep 20, Oct 26, Nov 17
CO	Denver	Sep 22, Oct 27
	Colorado Springs	Oct 25
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	New Haven	Sep 8
	Stamford	Nov 15
DC	Washington *(Federal)*	Sep 16, Oct 21, Nov 18
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	Jacksonville	Oct 19
	Orlando	Sep 14
GA	Atlanta	Sep 7, Oct 5, Nov 9
HI	Honolulu	Sep 13
IA	Des Moines	Sep 13, Nov 10
ID	Boise	Oct 5
IL	Chicago	Sep 15, Oct 11, Nov 16
	Springfield	Sep 14, Nov 9
IN	Indianapolis	Oct 13, Nov 17
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KY	Lexington	Sep 14
	Louisville	Oct 12
LA	New Orleans	Oct 28
	Shreveport	Oct 13
MA	Boston	Oct 12
	Burlington	Nov 18
	Springfield	Oct 12
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	Baltimore	Oct 19
ME	Portland	Oct 5
MI	Detroit	Sep 13, Oct 4, Nov 8
	Grand Rapids	Oct 12
MN	Minneapolis	Sep 27, Oct 19, Nov 10
MO	Kansas City	Sep 14, Oct 18
	St Louis	Sep 6, Oct 6, Nov 7
NC	Charlotte	Oct 20, Nov 17
	Raleigh	Sep 15, Nov 2
	Winston-Salem	Oct 5
NE	Omaha	Oct 4
NH	Concord	Sep 20
NJ	Iselin	Sep 15, Oct 13, Nov 17
	Princeton	Sep 15, Oct 4, Nov 22
NM	Albuquerque	Sep 29
NV	Las Vegas	Sep 22, Nov 10
NY	Albany	Sep 20, Nov 9
	Buffalo	Oct 4
	Long Island	Sep 20, Oct 19, Nov 16
	New York City	Sep 14, Sep 28, Oct 12, Oct 26, Nov 9, Nov 16
	Rochester	Sep 14, Nov 2
OH	Akron	Sep 20
	Cincinnati	Sep 15
	Cleveland	Oct 19
	Columbus	Sep 22
OK	Oklahoma City	Sep 13
	Tulsa	Oct 25
OR	Portland	Sep 8, Nov 15
PA	Harrisburg	Sep 26
	Philadelphia	Sep 19, Oct 26, Nov 18
	Pittsburgh	Oct 26
	Valley Forge	Sep 8, Nov 10
RI	Providence	Sep 22
SC	Charleston	Oct 5
	Columbia	Nov 16
	Greenville	Oct 19
TN	Memphis	Sep 14
	Nashville	Nov 9
TX	Amarillo	Sep 20
	Austin	Oct 20
	Dallas	Sep 7, Oct 4, Nov 2
	Ft. Worth	Nov 9
	Houston	Sep 8, Oct 6, Nov 10
	Midland	Oct 19
	San Antonio	Oct 21
UT	Salt Lake City	Sep 20, Nov 9
VA	Norfolk *(Federal)*	Oct 4
	Richmond	Oct 6, Nov 1
VT	Burlington	Sep 28
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	Spokane	Nov 3
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COMPUTERWORLD

Circle Reader Service Number 4

EDITORIAL

P. CHARLES LADOUCEUR

Occasionally in life, bigger is better. This is not necessarily the case when one tries to measure the effectiveness of a company's total investment in information systems. For example, how prudent is it to spend $5 million developing software internally when wholly adequate off-the-shelf packages might be available at half the cost?

It is for this reason that we feel particularly proud of the pioneering work we've done with the *Computerworld Premier 100* in seeking a valid measurement of information systems effectiveness. And sheer size of the total systems investment is but one of our criteria of this measurement.

Consider that the most compute-intensive business arena in the U.S. is the financial and banking sector. Yet companies in this sector do not dominate the Premier 100 — far from it. We find a mid-size utility firm leading the pack, with insurance, aerospace and manufacturing firms heavily represented on the list.

Clearly, bigger is not necessarily better in terms of measuring the overall effectiveness of systems investments. In some cases, it's merely bigger, and that means more costly and less efficient than it should be.

We are living in times when the ability of a company to leverage its MIS strategy to gain a competitive edge is becoming increasingly vital. And we will soon enter an era when the ability to do this will become absolutely essential to survive and prosper.

That is precisely why information systems managers must meet the cost-benefit gorilla head-on. It is also why a penny earned on enhanced systems efficiency can end up as two pennies on the company's bottom line.

We doff our caps to the companies of the Premier 100, as well as to those listed as headlining their respective vertical industries. They serve as models for firms of all sizes struggling to grab the golden ring of competitive advantage in a fiercely competitive world economy.

Bill Laberis

BILL LABERIS
Editor in Chief

Imagine spending $160 billion and not being able to account for it in any hard and fast manner.

That is the dilemma facing U.S. companies, which will spend that much in 1988 on information technology.

To provide systems executives with answers when their bosses come calling, we conducted a monumental, yearlong effort to measure how effectively organizations are investing in computer systems.

This information-packed magazine is the result of that effort. Containing exclusive rankings of 100 American corporations, the *Computerworld Premier 100* represents the first analysis of information systems' effectiveness.

We provide revealing data on how well companies are currently investing in information systems compared with their direct competitors. Budget figures, estimated market value data, training expenditures and personnel costs are all critical factors to information systems success. We use all of these factors to rank the companies, and we report on all of them in detail.

To gather the data — which has not been published anywhere before — we contacted hundreds of information systems executives in the largest corporations in 20 industries. We made more than 2,000 phone calls to reach the right people in the labyrinths of corporate America.

Many executives, looking for ways in which to measure themselves against competitors, willingly agreed to participate. The most difficult question we asked concerned the current market value of major systems. This particular request was frequently greeted with "Oh my God!" or a huge sigh and silent pondering.

This report sets a landmark in measuring computer systems' effectiveness. The following pages contain surprises, nuances and expected results. We trust you will find them very useful when the CEO drops by for a visit.

Mike Sullivan-Trainor

MICHAEL L. SULLIVAN-TRAINOR
Special Projects Editor

LEADERSHIP SHIFTS TO SMALLER COMPANIES

By Michael Sullivan-Trainor

Information systems executives are now learning what David taught Goliath a few thousand years ago: You don't need to be the biggest to wield a strategic advantage.

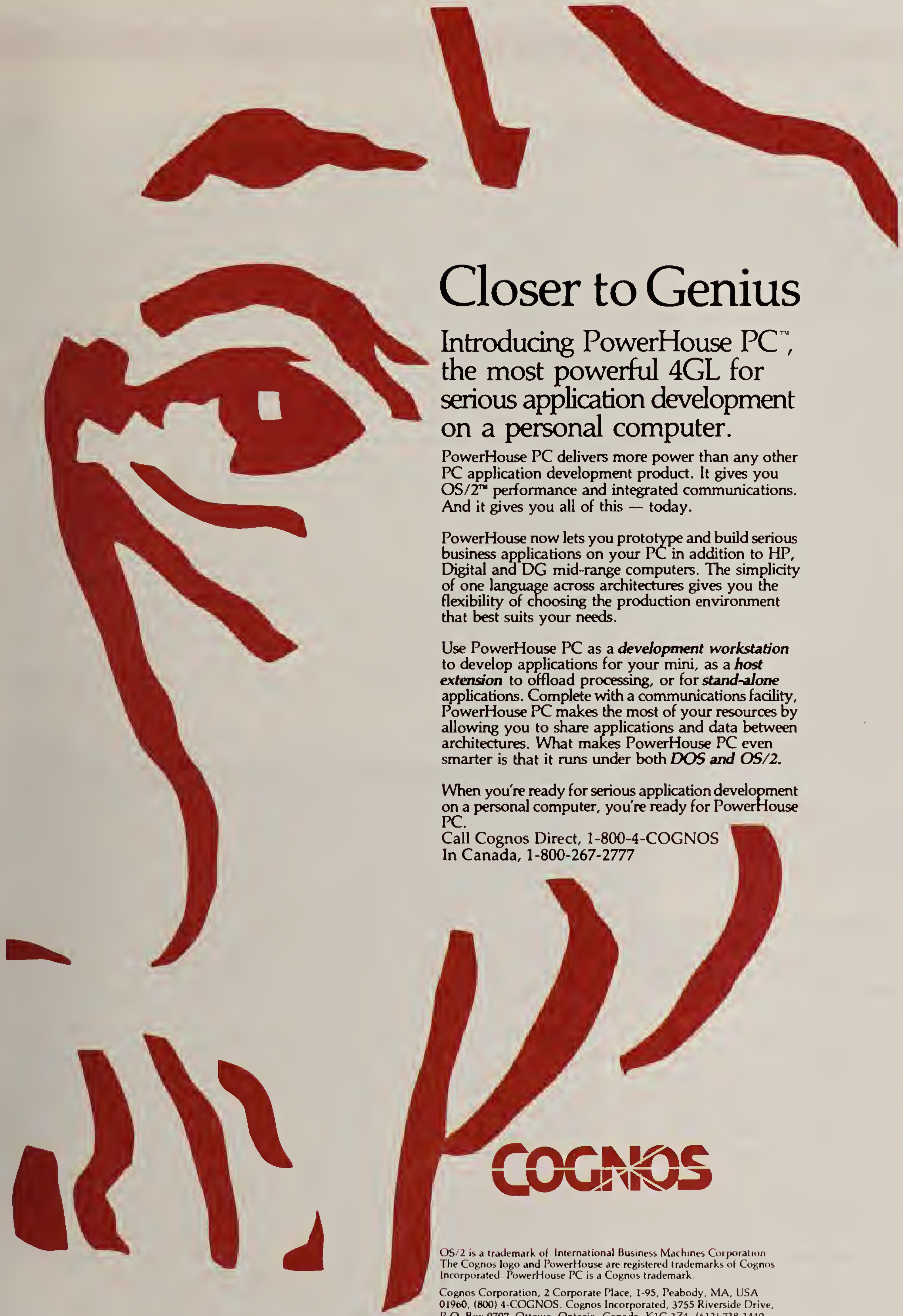
So it is that the most effective users of information systems are not the largest U.S. corporations, according to the *Computerworld Premier 100.*

The leaders in each industry rank at the top because they demonstrate a strong commitment to the factors that spell information systems success — investments in leading-edge systems that exceed those of their direct competitors; contributions to profit growth through applying systems to business needs; staffing with sufficient personnel without overspending; training systems professionals in new methods and technologies; and providing access to technology to users throughout the company.

Besides fitting this profile, the companies listed in the Premier 100 also share a common philosophy. Their strategies are aimed at developing competitive systems to capture greater market share.

"Technology is an equalizer," says Ted

MARK HEMPSTEAD



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Freiser, president of John Diebold and Associates in New York. "Large companies used to overpower everyone by making the cost of entering a market very high. Technology is now allowing smaller companies to compete very effectively."

According to Melvin Berkstein, head of Arthur Andersen's technology consulting practice, companies achieve competitive advantage through technology in two primary ways:

- By using systems to differentiate their products and services from competitors', most often through front-end marketing systems and databases.
- By applying automation to become the low-cost producer within an industry.

For example, Banc One, the No. 1 bank on the Premier 100 roster, is distinguishing its services from larger competitors' by implementing distributed applications that allow account representatives to meet all customer needs directly using personal computers, rather than depending on a central system.

By establishing a credit card network — part of a corporatewide network — top retailer J. C. Penney is creating new business through technology. In addition, to further differentiate itself from other companies, Penney runs a subsidiary whose mission is to add other stores and service stations to the network.

Northeast Utilities, the No. 1 corporation overall, is applying a powerful set of the latest technologies to keep costs down, including an ISDN network and beta-test applications.

In the business mainstream

Another common theme among the companies in the Premier 100 is the recognition of the need to integrate information technology with business strategy.

Identifying where systems can best be applied to business needs is not a task for information systems alone. "Early on, we learned that using technology for competitive advantage has a high payoff," says Freiser. "However, identifying the payoff opportunities is not something information systems can do. The direction has to come from line management."

At Dow Chemical, the top chemical company, information systems is moving from a function under manufacturing and engineering to the corporate level, and the organization will play an increasingly greater role in business planning.

Despite the emphasis on competitive advantage, many companies are also struggling with the need to contain costs.

"After the turmoil of Black Monday and continued mergers and consolidations within major industries, many companies are withholding long-range information systems investments," says Jerry Kanter, director of the Center for Information Management Studies at Babson College in Wellesley, Mass. "It is difficult to justify systems investments anyway — many managers went on faith. That faith is slipping away."

Few industries are facing greater pressure to control costs than the oil industry. In the face of economic pressures, Amoco, the No. 1 petroleum products company, sees systems as tools to create more efficient operations rather than as overhead to be cut back. Downsizing within Amoco's business units is increasing the demand for computer support.

Generally, according to Diebold's Freiser, service companies are better at recognizing the relevance of technology to meeting business needs. "The insurance industry creates products using technology — new types of policies and services," he says. "Without technology these things could not be offered."

At Travelers, the top insurance and financial services company among the 100, this benefit is well-recognized. Chairman Edward H. Budd sets technology implementation in key business areas as the No. 1 corporate goal. Past the stage at which automation of manual functions was required, Travelers assigns information systems staff to business areas to encourage the creation of competitive products.

"There is no question achieving competitive advantage through technology is on lots of people's minds — line managers and senior executives have heard about it," says Babson's Kantor. "The key to it is looking at where investments are being made not just how much."

Amounts being spent for information systems are only relevant in the context of a company's revenue and its competitors'. The corporation's total profitability must also be taken into account.

Other factors that are important to measure include training and personnel expenses, the currency of equipment in use and how much access users have to the technology. The Premier 100 assesses these factors to reveal who are the current leaders of the information systems charge.

UTILITIES TOP ALL INDUSTRIES IN 100

The Premier 100 shows that the biggest spenders on technology are not necessarily the most effective users.

Banks, which spend the most — an average of 4.9% of revenue — rank in the middle of the pack — two such companies scored in the top 30, with the remaining seven falling below 50.

An industry that keeps a low profile in general and in technology use in particular — utilities — did the best, with the No. 1 firm overall and four in the top 10. Of the 13 Premier 100 finishers in the utilities category, eight are in the top 30.

Just awakening to the value of information systems, retailers scored the worst among the 100. Of the three retailers listed, none ranked among the top 50.

Continued economic struggles in the oil patch lowered the chances for petroleum products companies to rise high among the 100. Of the seven petroleum organizations on the list, only two ranked in the top 50. Notably low in the rankings are giants Exxon (117) and Mobil (131), both of which spend a half a billion dollars or more on information systems.

Manufacturing companies scored well overall, with four in the top 10. However, the Big Three automotive manufacturers did not fare well; General Motors, which has an estimated systems budget of $2.8 billion, ranked 13th in its industry and 96th overall. Ford wound up 86th on the list, while Chrysler ranked 139th overall.

The transportation and communication services companies pushed two representatives into the top 20, but the remainder placed below 50. With the lowest average market value for major processors, the services companies own the most personal computers and terminals per employee.

Chemical companies and insurance and financial services all placed one or two finishers somewhere near the top.

HOW WE RANKED THE 100

Knowing how much a company spends on information systems is not enough to determine how well it is spending its money. The *Computerworld Premier 100* goes beyond bulk spending to objectively evaluate the most effective users of information systems.

The criteria, developed after consultation with leading industry experts, take into account current methods of determining systems effectiveness.

Six critical factors are examined to rank each company. These factors are then ranked, and the ranks are multiplied by a weighted factor to determine the final score. All the scores are added together for a total point value.

Estimated annual information systems budget as a percentage of revenue receives the heaviest weight — 30 points. Prior to ranking, the budget percentage is compared with an industry average budget as a percentage of revenue. Companies above the average receive more points than those below.

Another vital indication of systems use is the current market value of installed computer equipment. Companies today are able to obtain more power for the dollar, but a lack of new systems will eventually take its toll on efficiency. The ability to stay up to speed with technological changes also signifies company commitment. A weighted factor of 15 is applied to this criterion.

Information systems is, at least in part, responsible for maintaining profitability. The third criterion addresses this fact by measuring profitability during the past five years. Firms showing losses during the period get no points for the category, which carries a 15-point weight.

Managing staff costs is as important as investing in equipment. With more effective ways to run systems organizations with fewer people, companies are holding the line on staff spending. Firms that spend a lower percentage of their systems budget on personnel receive more points for this criterion, which receives a 10-point weight.

But keeping a streamlined staff well trained is also key to making effective use of technology. The more a firm spends on training as a percentage of the information systems budget, the more points it receives in this category. Fifteen points are assigned as a weight here.

Finally, providing user access to technology is very important in both supporting information systems within the company and in how well companies are able to implement strategic systems. The number of terminals and PCs as a percentage of total company employees is the sixth criteria, with a weight of 15.

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THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

RANK	COMPANY/IS EXECUTIVE	INDUSTRY	IND. RANK	TOTAL SCORE	ESTIMATED IS BUDGET (MILLIONS)	BUDGET % REVENUE
1	**Northeast Utilities** Tod O. Dixon, V.P.	Utilities	1	15,320	$75	3.60
2	**Polaroid Corp.** Albert L. Hyland, Dir.	Equip./Mater. manuf.	1	14,905	$75	4.25
3	**Northrop Corp.** W. Richard Howard, V.P.	Aero./Auto./Indust. manuf.	1	14,800	$300	4.90
4	**The Travelers Corp.** Lawrence A. Bacon, Sr. V.P.	Ins./Finan. services	1	14,600	$350	9.14
5	**Southwestern Bell Corp.** Kenneth R. Bender, V.P.	Utilities	2	14,135	$339	4.23
6	**Gillette Co.** None currently	Equip./Mater. manuf.	2	13,960	$80	2.52
7	**Abbott Laboratories** Kenneth Farmer, V.P.	Food/Consumer prods.	1	13,925	$125	2.84
8	**Bell Atlantic Corp.** Joseph Ambrozy, V.P.	Utilities	3	13,905	$325	3.15
9	**McDonnell Douglas Corp.** Ernie H. Ridenhour, V.P.	Aero./Auto./Indust. manuf.	2	13,885	$550	4.18
10	**MCI Communications Corp.** Allan Ditchfield, Sr. V.P.	Utilities	4	13,745	$175	4.44
11	**Baxter Healthcare Corp.** Michael S. Heschel, Corp. V.P.	Food/Consumer prods.	2	13,725	$160	2.57
12	**McGraw-Hill, Inc.*** Richard H. Shriver, Sr. V.P.	Trans./Commun./Other serv.	1	13,295	$125	7.13
13	**Dow Chemical Co.** Hans Huppertz, Dir.	Chemicals	1	13,215	$250	1.86
14	**The Lockheed Corp.** Dean Allen, V.P.	Aero./Auto./Indust. manuf.	3	13,195	$400	3.51
15	**Owens-Illinois, Inc.** Ray Davis, Mgr.	Equip./Mater. manuf.	3	13,045	$65	1.74
16	**The Mead Corp.** John K. Langenbahn, V.P.	Equip./Mater. manuf.	4	12,910	$50	1.18
17	**AT&T*** William Garrett, V.P.	Utilities	5	12,760	$600	1.78
18	**AMR (American Airlines)** Max Hopper, Sr. V.P.	Trans./Commun./Other serv.	2	12,720	$400	5.55
19	**Eastman Kodak Co.*** Katherine M. Hudson, Dir.	Equip./Mater. manuf.	5	12,655	$266	1.99
20	**GTE Corp.** Dennis Murphy, Dir.	Utilities	6	12,625	$525	3.40
21	**Merck & Co.*** Albert C. Cinorre, V.P.	Food/Consumer prods.	3	12,535	$150	2.96
22	**Texas Utilities Co.** H. B. Keating, Dir.	Utilities	7	12,455	$113	2.76
23	**New York Life Insurance Co.** Michael J. McLaughlin, Sr. V.P.	Ins./Finan. services	2	12,410	$125	2.23
24	**Banc One Corp.** David M. Van Lear, Pres., Banc One Serv.	Banking	1	12,400	$150	7.65
25	**Gencorp, Inc.** Linda George, Dir.	Equip./Mater. manuf.	6	12,385	$40	1.28

*Estimates are from *Computerworld* sources, not from the company.

ESTIMATED VALUE (MILLIONS)	VALUE % REVENUE	% BUDGET STAFF	% BUDGET TRAINING	TOTAL PCS & TERMINALS	% PC/TERMINAL PER EMPLOYEE	RANK
$125	6.00	34	5	4,110	44.19	**1**
$75	4.25	40	1	4,500	32.93	**2**
$125	2.06	55	5	20,000	42.10	**3**
$100	2.61	50	7	30,000	88.49	**4**
$197	2.46	50	2	55,000	81.72	**5**
$80	2.52	35	5	6,500	21.59	**6**
$125	2.84	34	6	14,000	38.04	**7**
$455	4.41	49	2	49,000	60.79	**8**
$450	3.42	47	3	50,000	45.87	**9**
$125	3.17	50	6	10,000	71.94	**10**
$50	.80	33	5	25,000	40.00	**11**
$125	7.13	50	5	3,000	19.23	**12**
$100	.74	33	5	25,000	47.89	**13**
$200	1.75	35	5	30,000	30.58	**14**
$100	2.69	25	5	8,000	17.71	**15**
$130	3.08	35	5	5,000	24.27	**16**
$600	1.78	40	5	89,000	28.70	**17**
$80	1.11	30	3	100,000	167.50	**18**
$100	.75	35	5	55,000	44.75	**19**
$275	1.78	35	5	63,000	39.13	**20**
$100	1.97	40	3	5,000	16.07	**21**
$35	.85	22	1	5,800	35.15	**22**
$52	.92	46	3	8,000	40.51	**23**
$50	2.55	35	5	300	2.25	**24**
$15	.48	50	10	3,000	21.2	**25**

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

RANK	COMPANY/IS EXECUTIVE	INDUSTRY	IND. RANK	TOTAL SCORE	ESTIMATED IS BUDGET (MILLIONS)	BUDGET % REVENUE
26	**International Paper Co.*** Gerhard Seblatnigg, Dir.	Equip./Mater. manuf.	7	12,370	$100	1.28
27	**Goodyear Tire & Rubber Co.** Joseph H. Gilchrist, Ast. Comp.	Equip./Mater. manuf.	8	12,285	$140	1.38
28	**Contel Corp.** Kenneth Bottonari, V.P.	Utilities	8	12,065	$150	5.16
29	**Norwest Corp.** John Geiken, Grp. Mgr.	Banking	2	11,975	$110	4.78
30	**Nationwide Mutual Ins. Co.*** Daniel M. Fullerton, V.P.	Ins./Finan. services	3	11,935	$130	1.87
31	**Textron, Inc.** Cecil W. Labhart, Dir.	Aero./Auto./Indust. manuf.	4	11,865	$150	2.64
32	**Deere & Co.** Robert Bulen, Dir.	Aero./Auto./Indust. manuf.	5	11,840	$140	3.38
33	**General Signal Corp.** Stefan Gladyszewski, Ast. Comp.	Equip./Mater. manuf.	9	11,830	$50	3.1
34	**Rockwell International Corp.** James F. Sutter, Dir.	Aero./Auto./Indust. manuf.	6	11,825	$450	3.71
35	**Georgia-Pacific Corp.*** Fred Radford, Dir.	Equip./Mater. manuf.	10	11,710	$150	1.74
36	**Pfizer, Inc.** William Mullin, V.P.	Food/Consumer prods.	4	11,700	$125	2.54
37	**American Cyanamid Co.** Edward A. Lustig, Corp. Dir.	Chemicals	2	11,690	$75	1.80
38	**General Electric Co.** Edward J. Skiko, V.P.	Equip./Mater. manuf.	11	11,650	$1,100	2.79
39	**Smith Kline Beckman Corp.** John Blood, Sup.	Food/Consumer prods.	5	11,605	$175	4.04
40	**Amoco Corp.*** John R. Reid, Gen. Mgr.	Petroleum products	1	11,515	$200	.99
41	**Caterpillar, Inc.** Dale L. Fieldcamp, Mgr.	Aero./Auto./Indust. manuf.	7	11,450‡	$140	1.71
42	**Corning Glass Works** Harvey R. Shrednick, V.P.	Equip./Mater. manuf.	12	11,450‡	$30	1.43
43	**Metropolitan Life Ins. Co.** Daniel J. Cavanaugh, Sr. V.P.	Ins./Finan. services	4	11,380	$225	1.61
44	**United Technologies Corp.*** Roger Brady, Corp. Mgr.	Aero./Auto./Indust. manuf.	8	11,365	$300	1.74
45	**Teachers Ins. & Annuity Assn.** John A. Putney Jr., Exec. V.P.	Ins./Finan. services	5	11,345	$56	1.83
46	**Bankamerica Corp.*** Michael Simmons, Exec. V.P.	Banking	3	11,275	$500	5.12
47	**Southern Company Services, Inc.** M. Eul Wade Jr., Sr. V.P.	Utilities	9	11,270	$125	1.78
48	**Unocal Corp.*** Gordon Dolfie, Dir.	Petroleum products	2	11,205	$125	1.47
49	**Corestates Financial Corp.** Bipin C. Shah, Vice Chair.	Banking	4	11,160	$60	4.14
50	**Sara Lee Corp.** Vincent H. Swoyer, V.P.	Food/Consumer prods.	6	11,095	$250	2.73

*Estimates are from *Computerworld* sources, not from the company.

‡In the case of ties in total score, rankings were determined by analyzing additional financial data.

ESTIMATED VALUE (MILLIONS)	VALUE % REVENUE	% BUDGET STAFF	% BUDGET TRAINING	TOTAL PCS & TERMINALS	% PC/TERMINAL PER EMPLOYEE	RANK
$150	1.93	35	5	10,000	21.97	**26**
$125	1.23	36	1	22,000	19.18	**27**
$50	1.72	50	3	5,000	22.32	**28**
$120	5.22	31	2	14,000	88.05	**29**
$80	1.15	70	5	5,000	41.66	**30**
$50	.88	45	1	10,000	15.03	**31**
$53	1.28	54	3	11,000	29.02	**32**
$50	.62	23	2	8,000	41.58	**33**
$48	.39	34	2	30,000	25.27	**34**
$100	1.16	35	5	4,000	9.52	**35**
$125	2.54	45	3	5,000	12.28	**36**
$125	3.00	38	5	5,000	14.59	**37**
$200	.50	32	2	99,000	29.95	**38**
$30	.69	35	5	7,500	21.42	**39**
$100	.49	40	5	15,000	32.05	**40**
$200	2.44	60	4	18,000	33.45	**41**
$15	.71	39	3	6,000	22.90	**42**
$158	1.13	40	2	24,000	63.15	**43**
$216	1.25	40	5	30,500	15.90	**44**
$2	.06	54	1	3,500	114.19	**45**
$100	1.03	35	5	30,000	46.88	**46**
$125	1.78	31	1	12,000	37.73	**47**
$100	1.18	30	2	6,000	33.14	**48**
$50	3.45	30	1	5,000	64.93	**49**
$125	1.36	40	5	6,000	6.68	**50**

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

RANK	COMPANY/IS EXECUTIVE	INDUSTRY	IND. RANK	TOTAL SCORE	ESTIMATED IS BUDGET (MILLIONS)	BUDGET % REVENUE
51	**American Express Co.*** None currently	Ins./Finan. services	6	11,080	$800	4.5
52	**E.I. Du Pont De Nemours and Co.** Raymond E. Cairns Jr., V.P.	Chemicals	3	11,030	$775	2.54
53	**Wickes Companies** William Mann, V.P.	Equip./Mater. manuf.	13	11,025	$100	2.87
54	**Citicorp*** James Banbury, V.P.	Banking	5	11,020‡	$1,500	5.40
55	**Middle South Utilities, Inc.*** Robert DeLoach, V.P.	Utilities	10	11,020‡	$45	1.30
56	**USX Corp.** J. R. McAfee, Mgr.	Petroleum products	3	11,010	$175	1.25
57	**First Union Corp.** Charles G. Klapheke, Sr. V.P.	Banking	6	10,975	$120	4.56
58	**CBS, Inc.*** Peter J. Schementi, V.P.	Trans./Commun./Other serv.	3	10,915	$40	1.44
59	**Monsanto Co.*** Leonard A. Cohn, V.P.	Chemicals	4	10,890	$160	2.09
60	**Time, Inc.*** James Mussallem, Dir.	Trans./Commun./Other serv.	4	10,885	$60	1.43
61	**Federal Express Corp.** Ron J. Ponder, Sr. V.P.	Trans./Commun./Other serv.	5	10,840‡	$190	5.39
62	**Reynolds Metals Co.** James T. Matsey, Corp. Dir.	Equip./Mater. manuf.	14	10,840‡	$75	1.75
63	**Dun & Bradstreet Corp.*** Walter Peltz, Exec. V.P.	Trans./Commun./Other serv.	6	10,830‡	$50	1.48
64	**Sun Co.** Dudley P. Cooke, Gen. Mgr.	Petroleum products	4	10,830‡	$125	1.43
65	**Primerica Corp.** Thomas R. Gaughan, V.P.	Ins./Finan. services	7	10,820	$120	3.18
66	**Duke Power Co.** George E. Stubbins, V.P.	Utilities	11	10,770	$70	1.88
67	**J. C. Penney Co.** David Evans, Dir.	Retailing	1	10,705	$225	1.46
68	**Mutual Benefit Life Ins. Co.** Charles G. McCaig, Sr. V.P.	Ins./Finan. services	8	10,700	$45	2.24
69	**Union Carbide Corp.** T. B. Smith, Mgr.	Chemicals	5	10,675	$125	1.80
70	**Home Federal Savings & Loan** Edwin R. Nichols, CIO	Banking	7	10,650‡	$52	4.13
71	**Johnson & Johnson*** Raymond Giovannelli, V.P.	Food/Consumer prods.	7	10,650‡	$200	2.49
72	**First Chicago Corp.*** Peter Miller, Sr. V.P.	Banking	8	10,600‡	$200	4.71
73	**Pennzoil Co.** Patrick L. Manning, Pres.	Petroleum products	5	10,600‡	$33	1.84
74	**Sears Roebuck and Co.** Charles Moran, Sr. V.P. & CIO.	Retailing	2	10,510	$600	1.23
75	**RJR Nabisco, Inc.*** Thomas Zoeller, V.P.	Food/Consumer prods.	8	10,485	$240	1.51

*Estimates are from *Computerworld* sources, not from the company.

‡In the case of ties in total score, rankings were determined by analyzing additional financial data.

ESTIMATED VALUE (MILLIONS)	VALUE % REVENUE	% BUDGET STAFF	% BUDGET TRAINING	TOTAL PCS & TERMINALS	% PC/TERMINAL PER EMPLOYEE	RANK
$400	2.25	40	4	40,000	49.07	51
$140	.45	50	7	25,000	17.76	52
$200	5.75	38.2	2	5,000	8.33	53
$400	1.45	35	5	20,000	22.39	54
$30	.86	48	2	10,000	72.99	55
$200	1.43	33	2	20,000	37.38	56
$14	.51	18	1	8,000	40.40	57
$20	.72	35	5	3,000	43.47	58
$130	1.70	30	2	10,000	19.72	59
$53	1.26	40	2	4,500	83.33	60
$50	1.41	35	2	10,000	21.59	61
$125	2.91	35	5	6,200	22.71	62
$100	2.97	45	5	10,000	16.94	63
$100	1.15	33	5	6,000	25.97	64
$60	1.59	45	1	5,000	20.16	65
$30	.80	20	3	6,275	30.75	66
$75	.48	35	5	80,000	44.81	67
$7	.35	54	2	34,000	100	68
$175	2.53	35	3	8,000	18.55	69
$13	1.03	30	7	2,800	71.79	70
$60	.74	45	5	20,000	2.57	71
$50	1.17	47	5	10,000	72.99	72
$12	.67	38	1.2	1,725	27.82	73
$750	1.54	18	2	140,000	28.38	74
$60	.37	45	5	50,000	41.55	75

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

RANK	COMPANY/IS EXECUTIVE	INDUSTRY	IND. RANK	TOTAL SCORE	ESTIMATED IS BUDGET (MILLIONS)	BUDGET % REVENUE
76	**Carter Hawley Hale Stores, Inc.*** Paul Burrows, V.P.	Retailing	3	10,465	$40	1.51
77	**Burlington Industries, Inc.** E. Ritchie Fishburne, Dir.	Equip./Mater. manuf.	15	10,460	$50	1.52
78	**Minnesota Mining & Mfg. Co.** Donald Siegfried, Exec. Dir.	Equip./Mater. manuf.	16	10,440	$140	1.48
79	**Pepsico, Inc.** Allan B. Deering, V.P.	Food/Consumer prods.	9	10,410‡	$250	2.17
80	**St. Paul Companies, Inc.*** Gary Hanson, V.P.	Ins./Finan. services	9	10,410‡	$105	3.11
81	**Bellsouth Corp.*** Preston Williamson, Ast. V.P.	Utilities	12	10,405‡	$160	1.30
82	**Farmers Group, Inc.** Edward A. Terhar, V.P.	Ins./Finan. services	10	10,405‡	$75	1.18
83	**Atlantic Richfield Co.** Allen N. Smith, Mgr.	Petroleum products	6	10,385	$240	1.47
84	**The Coca-Cola Co.*** Hugh Switzar, V.P.	Food/Consumer prods.	10	10,375	$100	1.30
85	**Manufacturers Hanover Corp.** H. Edward Nyce, Exec. V.P.	Banking	9	10,350	$380	4.89
86	**Ford Motor Co.** S. I. Gilman, Exec. Dir.	Aero./Auto./Indust. manuf.	9	10,325	$836	1.16
87	**Salomon, Inc.*** David Gertler, Dir.	Ins./Finan. services	12	10,300	$186	3.09
88	**Capital Cities/ABC*** Teresa Lykoudis, Mgr.	Trans./Commun./Other serv.	7	10,270‡	$60	1.35
89	**Teledyne, Inc.*** Richard Tracy, Dir.	Equip./Mater. manuf.	17	10,270‡	$50	1.55
90	**General Dynamics Corp.** Asaph H. Hall, V.P.	Aero./Auto./Indust. manuf.	10	10,265	$200	2.14
91	**The Boeing Co.*** Carl Munson, V.P.	Aero./Auto./Indust. manuf.	11	10,240	$300	1.95
92	**Pacific Gas and Electric Co.** John Danielson, V.P.	Utilities	13	10,135	$125	1.73
93	**American Standard, Inc.** Gary J. Biddle, V.P.	Aero./Auto./Indust. manuf.	12	10,065	$53	1.54
94	**PPG Industries, Inc.*** Sally E. Wellinger, Corp. Dir.	Equip./Mater. manuf.	18	10,060	$40	.77
95	**American International Group*** Arnold Felberbaum, Sr. V.P.	Ins./Finan. services	13	10,005	$350	3.10
96	**General Motors Corp.*** David H. Hill, Exec.	Aero./Auto./Indust. manuf.	13	9,990	$2,880	2.82
97	**First Wachovia Corp.** Charles Lewis, Sr. V.P.	Banking	10	9,925‡	$50	2.78
98	**Shell Oil Co.** Leroy L. Drury, V.P.	Petroleum products	7	9,925‡	$200	.95
99	**Litton Industries*** George Repsold, Mgr.	Equip./Mater. manuf.	19	9,910	$60	1.35
100	**General Mills, Inc.*** Richard Dietz, V.P.	Food/Consumer prods.	11	9,900	$100	1.92

*Estimates are from *Computerworld* sources, not from the company.

‡In the case of ties in total score, rankings were determined by analyzing additional financial data.

ESTIMATED VALUE (MILLIONS)	VALUE % REVENUE	% BUDGET STAFF	% BUDGET TRAINING	TOTAL PCS & TERMINALS	% PC/TERMINAL PER EMPLOYEE	RANK
$40	1.51	35	5	10,000	28.57	**76**
$100	3.04	50	2	4,400	10	**77**
$140	1.48	41	5	27,000	32.76	**78**
$50	.43	52	5	5,000	2.27	**79**
$60	1.78	45	5	8,000	81.36	**80**
$274	2.23	35	5	33,000	33.74	**81**
$75	1.18	35	5	14,000	90.32	**82**
$40	.24	46	5	12,000	45.80	**83**
$40	.52	35	5	6,000	26.43	**84**
$100	1.28	45	3	10,000	33.67	**85**
$420	.58	34	7	80,000	22.83	**86**
$50	.83	40	5	6,000	75	**87**
$40	.90	35	5	10,000	50	**88**
$50	1.55	35	5	6,000	13.45	**89**
$200	2.14	37	1	15,000	14.23	**90**
$100	.65	35	5	20,000	14.69	**91**
$75	1.04	57	3	16,000	58.60	**92**
$8	.23	45	1.5	4,500	11.50	**93**
$70	1.35	35	5	7,000	19.02	**94**
$42	.37	30	2	10,000	35.71	**95**
$385	.37	45	5	114,000	14.01	**96**
$60	3.34	35	5	5,000	38.16	**97**
$65	.31	40	2	24,000	72.32	**98**
$75	1.69	40	2	10,000	18.21	**99**
$50	.96	45	5	4,000	6.26	**100**

NORTHEAST: A UTILITY'S NO. 1 STRATEGY FOR BEATING THE HEAT

By Connie Winkler

P. CHARLES LADOUCEUR

Tod Dixon, vice-president of Northeast's information resources group

The heat is on Northeast Utilities, the No. 1 company in the *Computerworld Premier 100.* Facing increased demand due to record temperatures this summer, the utility is also meeting unexpected competition from independent power producers.

"The utilities business is moving from a protected regulatory industry to a highly competitive one, and the only way to survive is to use every piece of technology available," says Tod O. Dixon, vice-president of Northeast's information resources group.

Northeast spends nearly 4% of its annual revenue on information systems to control costs and improve customer service. "Electricity is a commodity product. The only things we can compete on are price and service," Dixon says.

The utility is using computer systems in many areas to streamline power generation and improve distribution. Northeast is currently engaged in the following:

- Testing one of the largest Integrated Services Digital Network (ISDN) systems to improve its response to customers' requests.
- Acting as a beta-test site for mainframe, minicomputer and communications vendors.
- Running an adaptable internal corporatewide network, including an electronic mail system using clustered Digital Equipment Corp.'s VAXs and All-In-1 software.
- Using new technology, such as bar coding and handheld computers, to track environmental data such as low-level radioactive wastes.

The company uses computer-based technologies as much as possible, including in-process control systems at the generating plants and tracking weather and environmental conditions. The ISDN system — the first large networked system developed by Northern Telecom — will enable Northeast's customer service group to know the phone number of an incoming caller so it can improve customer service, Dixon explains.

Approximately 65% of Northeast's service calls come from a problem location. In a heat-wave outage, for instance, a prerecorded message has the ability to inform customers that the problem in their neighborhood is being fixed.

"We will handle the call in a human way without having a human involved," Dixon says. His Northern Telecom Displayphone already allows him to know who is calling from 3,000 lines within Northeast's six computer sites.

The phone number will also serve as Northeast's customer file number so that service representatives, who handle thousands of calls each day, do not need to sift through confusing account numbers or address listings. Northern Telecom was interested in using Northeast as a beta-test site because of the complexity of delivering ISDN to 12,000 lines through some 44 networked switchboards.

"We operate more interconnected PBXs than most," Dixon says in an understatement.

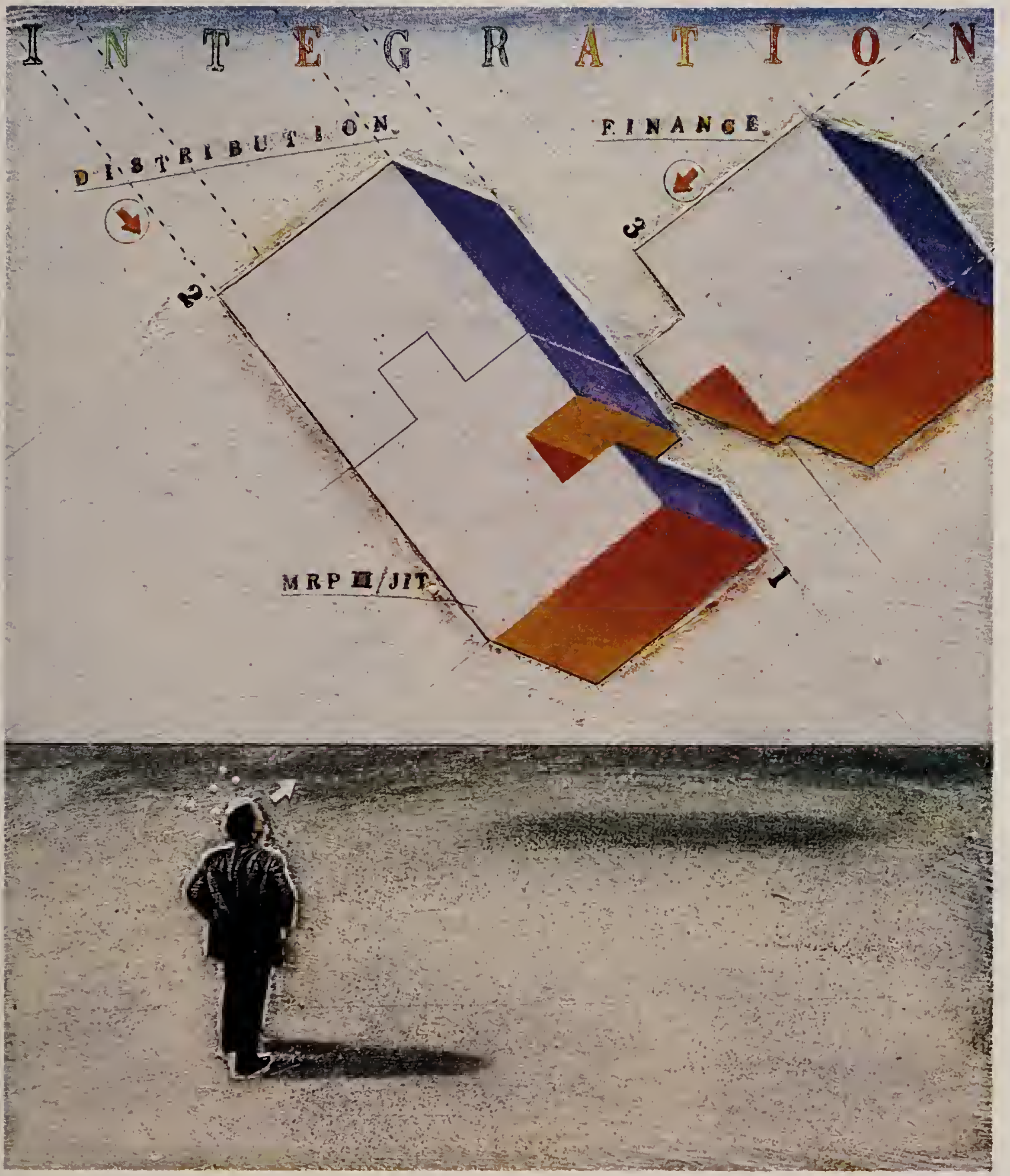
The ISDN network is operating at four locations, with all 44 scheduled to be on-line by second quarter, 1989. The next communications projects will be installing T1 trunks and fiber-optic network lines over the utility's existing rights of way. The Northern Telecom project is the latest beta test Dixon will disclose. He likes running two or three such tests at a time.

Big on beta testing

"I'm very big on beta testing," says the former industrial engineer, who found he could do a lot more engineering with computers. "But we don't do it unless there's a financial or operations benefit, allowing us to get the product sooner."

The biggest benefit of the beta projects may be on the morale of employees; they like the prestige and learning experience of working on seemingly clandestine projects with major vendors.

The utility, with its heavy nuclear engineering processing (two-thirds of its electricity comes from nuclear plants), was also a beta-test site several years ago for IBM's 3090 Model 400E with vector processing. Northeast and IBM ironed out problems in processing Northeast's program code that had initially been written for Control Data



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Corp. computers, Dixon says.

While the heat wave of 1988 was unexpected, it is as if Northeast began preparing for the current power crunch back in 1983. At the urging of the company's president and Cambridge, Mass., consultancy Arthur D. Little, Inc., the utility began aggressively streamlining its two diverse computer architectures, numerous standalone office systems and voice/data communications.

When Dixon was brought in to carry out the project five years ago, he analyzed the end-user computing needs and found no departmental applications. So he consolidated a collection of independent personal and administrative office applications under the All-In-1 system that runs on a variety of DEC processors from a VAX-11/785 to an 8700.

Dixon says "a lot more questions are being asked. We don't have the luxury of being sloppy anymore."

Dixon decides to invest in new technology only if he can demonstrate that it will benefit the company's bottom line. He also believes that the combination of beta tests and training investments is essential.

"We want the best people, and the only way to attract them is by providing opportunities to learn and work with the latest technology," he says.

Training, which totals about 5% of the systems budget, is one of the few areas in which cutbacks are not occurring.

According to last year's annual report, Northeast recorded "creditable though not outstanding results" — revenue of $2.08 billion and net income of $229 million. This is a major improvement over 1986, when it wrote off portions of its investment in New Hampshire's blocked Seabrook nuclear power plant.

"We're sharpening our pencils more than we did before," Dixon says. "A lot more questions are being asked, and the questions are more complex. We don't have the luxury of being sloppy anymore."

Containing costs is a key goal of the utility, which already eliminated $59 million from 1988 operating and maintenance expenses.

Northeast owns portions of four nuclear generating companies, so the company operates under strong environmental regulations. Low-level radioactive waste is now being marked with bar codes and tracked from cradle to grave by small 32K-byte handheld computers, Dixon says, noting these handheld computers are similar to those that Northeast's 400 meter readers already use.

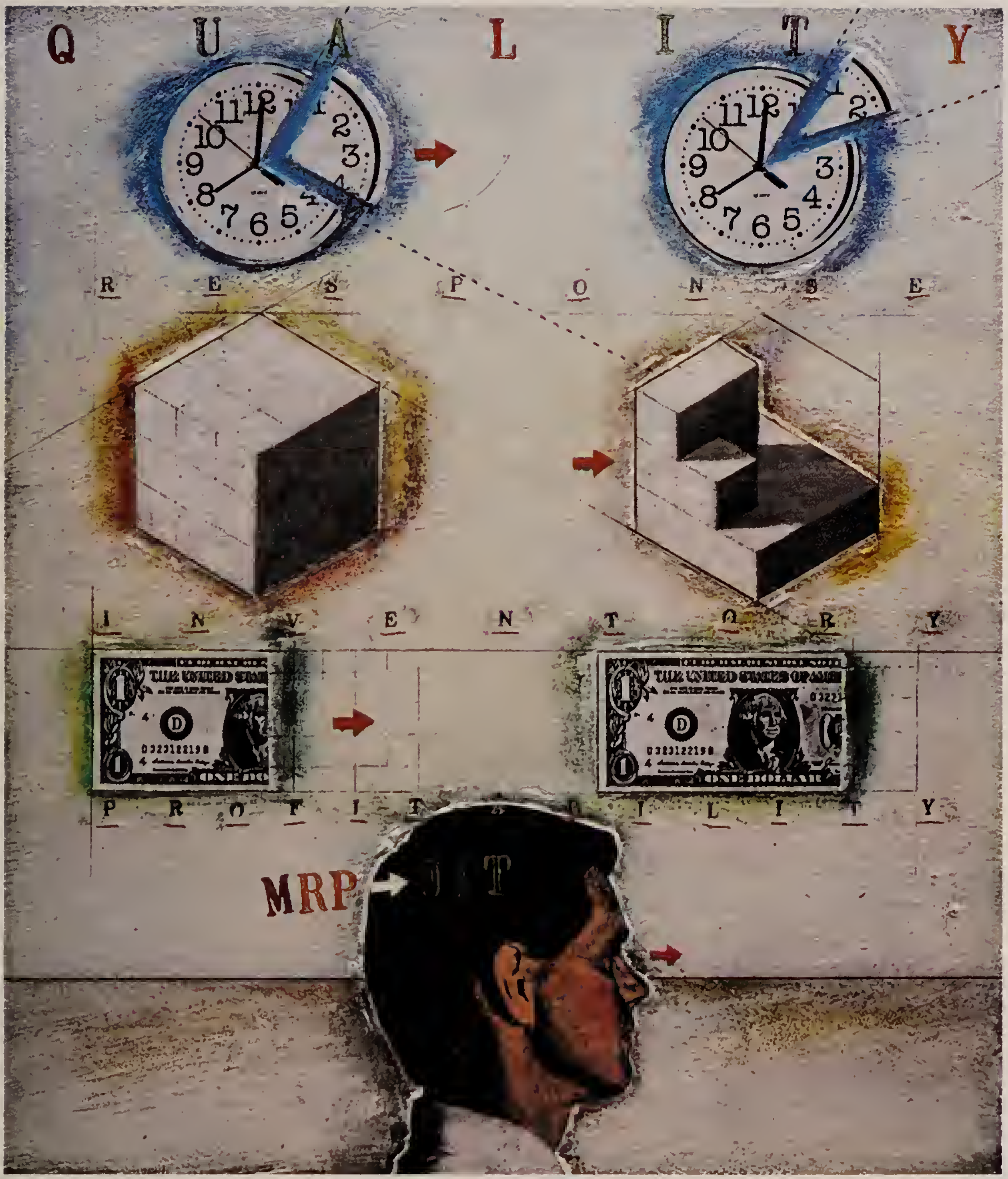
The company also uses communications and computer technologies to monitor the weather and river and shore levels.

"After all, if it's cloudy, customers are going to turn on their lights," Dixon adds — to say nothing of the air conditioners.

Winkler, former New York bureau chief for Computerworld, *writes about information strategies and management technology.*

UTILITIES

Industry rank	Company/Location/Total employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**Northeast Utilities** Hartford, Conn. 9,300	1	15,320	$2,081M	$229.1M	$75M
2	**Southwestern Bell Corp.** St. Louis 67,300	5	14,135	$8,003M	$1,047.1M	$339M
3	**Bell Atlantic Corp.** Arlington, Va. 80,600	8	13,905	$10,298M	$1,240.4M	$325M
4	**MCI Communications Corp.** Washington, D.C. 13,900	10	13,745	$3,939M	$85M	$175M
5	**AT&T** Warren, N.J. 310,000	17	12,760	$33,598M	$2,044M	$600M
6	**GTE Corp.** Stamford, Conn. 161,000	20	12,625	$15,421M	$1,118.8M	$525M
7	**Texas Utilities Co.** Dallas 16,500	22	12,455	$4,083M	$680M	$113M
8	**Contel Corp.** Atlanta 22,400	28	12,065	$2,905M	$43M	$150M
9	**Southern Company Services, Inc.** Atlanta 31,800	47	11,270	$7,010M	$554.4M	$125M
10	**Middle South Utilities, Inc.** New Orleans 13,700	55	11,020	$3,455M	$813.9M	$45M



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POLAROID PIONEERS INFORMATION SYSTEMS TO BATTLE MARKET ADVERSITY

By Michael Ball

Technology was magic when Polaroid Corp. made its name with the first instant camera. Imagine a picture on the spot, just 60 seconds after you took it!

Ever since, the company has prided itself on investments in technology. Today, the pride is still evident but the magic is gone. Competitors as close as Rochester, N.Y., and as far as Japan continue to offer breakthroughs that cut into Polaroid's profits.

One-hour photo-developing quick stops and easy-to-use 35mm cameras are cutting into Polaroid's instant photography market. So the firm is offering limited-shelf-life films and chemicals against hungry competitors.

Understandably, and successfully so far, the firm continues to turn to information systems to survive these difficulties. Polaroid ranks No. 1 among equipment and material manufacturers surveyed for the *Computerworld Premier 100* because of the company's reliance on technology. Polaroid's information systems budget totals about 4% of revenue, significantly higher than the 1.4% average for its industry. Current market value of installed systems also hovers near the 4% mark.

MARC ALCAREZ

Al Hyland, Polaroid's systems director

The corporate strategy driven by new Chief Executive Officer I. MacAllister "Mac" Booth also calls for more products and fewer employees. Through attrition and early retirement, Booth wants the company to shrink to less than half the staff of only two years ago — from 20,000 to today's 13,000 and toward 9,500.

Aside from these challenges, Polaroid is in the midst of battling a $2.28 billion takeover attempt by Shamrock Holdings, Inc., a communications company owned by the Roy E. Disney family.

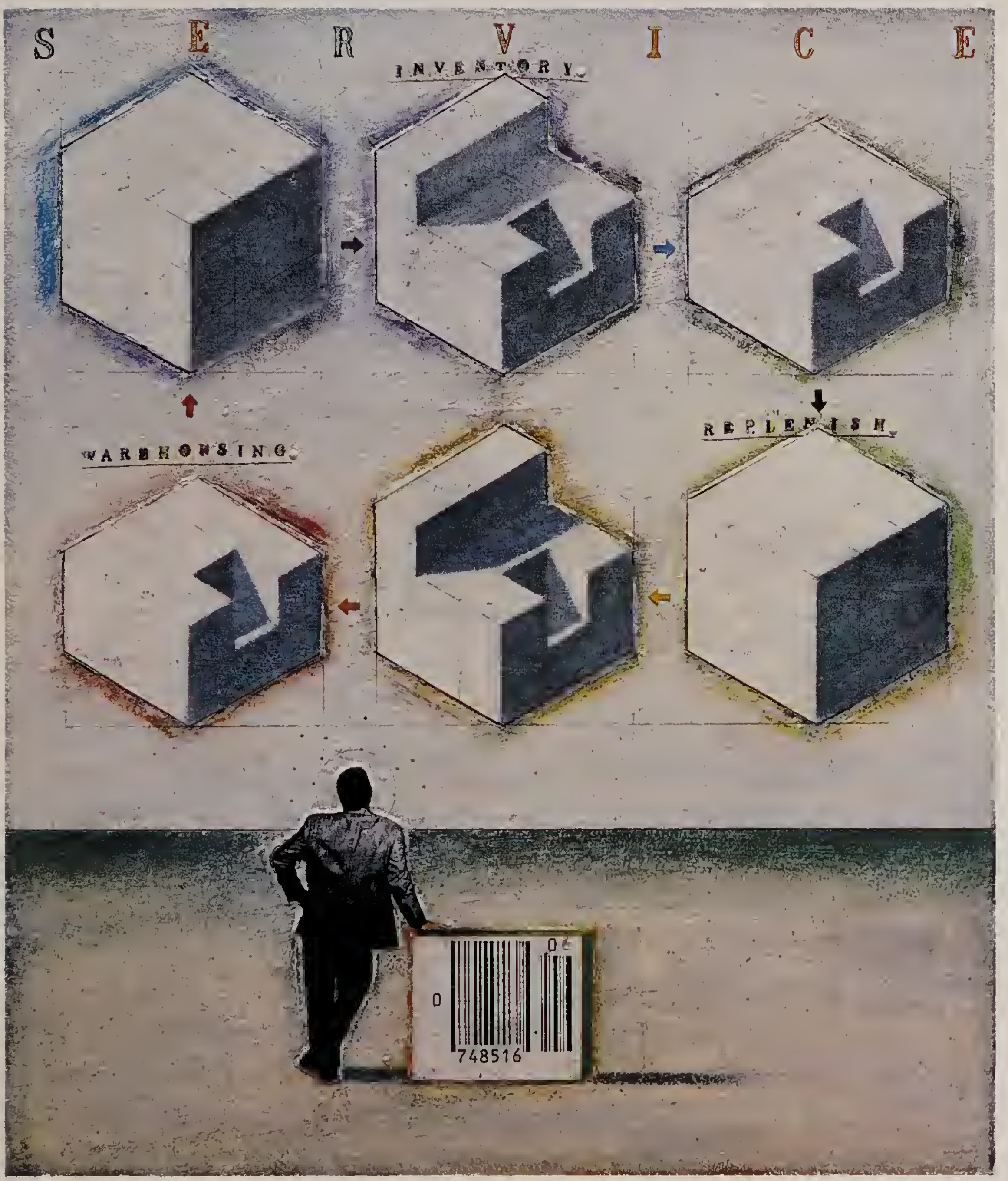
The one bright light on the corporate horizon is the likely award of $1 billion to $2 billion to Polaroid from Eastman Kodak Co. because of instant photography patent infringements.

Marshaling the information systems forces to control costs and create efficiencies throughout the company is Albert L. Hyland, director of Polaroid's worldwide systems management division at the firm's Waltham, Mass., information systems headquarters.

"We constantly have to find inefficiencies in production and distribution," Hyland says. "We want to service our customers more regularly, with weekly shipments in the U.S. Only knowing and forecasting what the customer wants lets us control our production and inventory costs on our end."

Polaroid has pioneered advanced distribution, forecasting and tracking systems as well as broadened its networking and workgroup computing functions, Hyland says.

The hardware to support these applications is what Hyland calls "an IBM sandwich" — three IBM mainframes (two 3081s in Waltham and a 4381 in Scotland), 150 DEC and IBM minicomputers and 4,500 IBM-compatible terminals and personal computers. These systems run from the lab with computer-aided design and manufacturing in chip and molecular design through production planning and monitoring into finance



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and distribution.

Most of the software is custom or customized. Seven years ago, the company upgraded its distribution system to include new functions for on-line order entry and need allocation. These applications run domestically on two DEC VAX 8500-class machines and seven IBM 8140s in Europe feeding into the mainframes.

The company's strategy is in line with an industry trend to rely more heavily on the middle and bottom of the computer sandwich. "The centralized mainframe is being made obsolete by distributed workstation technology," says Bill Stoddard, head of Arthur Andersen & Co.'s manufacturing practice.

Advanced manufacturing forecasting and control are only possible through innovative information systems, Stoddard says, leading to a combination of just-in-time and manufacturing resources planning.

"The only way to make the product pipeline shorter is through timely information flow from vendor to wholesaler to warehouse to factory," he adds. "The old systems may have been batch-oriented and allowed plenty of time to let accounting calculate. But today's response-cycle requirements are much more demanding."

Complex pipeline

For Polaroid, the product pipeline involves more than getting film to the retailer. The dated boxes must be in precise quantities, which the company must forecast accurately. Information systems cannot depend on wholesalers, because it bases its expensive inventory and production on the figures.

"Only knowing exactly what customers will need lets us control costs," Hyland says.

Despite its strategic importance, information systems will not be immune from corporate change. "Obviously, we will lose some in MIS," Hyland says. "Some of the older managers will retire, and some of the younger, nervous people will pick up the phone and call headhunters."

However, Hyland sees the biggest crunch coming from the main organization. "There will be fewer people throughout the company, which will mean more requests for MIS," he says.

To make sure his staff understands a variety of information systems in operation, Hyland moves them around. "We move people all over, from research and engineering through manufacturing and the classic business applications," he says. "We build skills and depth. They have to be reasonably knowledgeable, though not experts, even in the technical areas."

Hyland sees this need becoming even more important as the company shrinks staff and heads toward a future of products based on new technologies, such as electronic imaging.

Polaroid hopes to revive interest in instant photography by introducing a new generation of products, which combine electronics with the use of heat to develop film. Perhaps the mixture of microprocessors and imaging systems will help the company rediscover some of its magic.

Ball is a free-lance writer based in Boston.

EQUIPMENT AND MATERIALS MANUFACTURING

Industry rank	Company/Location/Total employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**Polaroid Corp.** Cambridge, Mass. 13,662	2	14,905	$1,764M	$116M	$75M
2	**Gillette Co.** Boston 30,100	6	13,960	$3,167M	$230M	$80M
3	**Owens-Illinois, Inc.** Toledo, Ohio 45,166	15	13,045	$3,715M	$179M	$65M
4	**The Mead Corp.** Dayton, Ohio 20,600	16	12,910	$4,208.8M	$217.7M	$50M
5	**Eastman Kodak Co.** Rochester, N.Y. 122,900	19	12,655	$13,305M	$1,178M	$266M
6	**Gencorp, Inc.** Akron, Ohio 14,100	25	12,385	$3,101M	$475M	$40M
7	**International Paper Co.** Purchase, N.Y. 45,500	26	12,370	$7,763M	$407M	$100M
8	**Goodyear Tire & Rubber Co.** Akron, Ohio 114,700	27	12,285	$10,123.2M	$770.9M	$140M
9	**General Signal Corp.** Stamford, Conn. 19,126	33	11,830	$1,603M	$69M	$50M
10	**Georgia-Pacific Corp.** Atlanta 42,000	35	11,710	$8,603M	$458M	$150M

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Circle Reader Service Number 10

NORTHROP DESIGNS OWN SYSTEMS TO ANSWER PRESSURE TO INTEGRATE

By Glenn Rifkin

Despite earning the top spot in the aerospace, automotive and industrial segment of the Premier 100, Northrop Corp. is not interested in creating a business out of information systems, as some competitors have.

"Our job is to build aircraft," says W. Richard Howard, vice-president of information resource management.

To that end, the $6 billion defense contractor is focusing attention on using systems to better integrate its engineering and manufacturing capabilities. In a company whose lifeblood is technology, Howard's group faces intense pressure to integrate what is commercially available and build what is not.

Recent troubles at Northrop exacerbate that pressure. Plagued by production problems in its MX Peacekeeper missile guidance systems development and charges of cost overruns in its B2 Stealth bomber program, Northrop is intent on using technology to get product design and manufacturing functioning at its peak.

Howard, who oversees 3,000 systems professionals in the Los Angeles-based company, points out that information systems at Northrop goes far beyond the traditional data processing function. "Information

MARK RICHARDS

Richard Howard, Northrop's vice-president of information resource management resource management in this world is not DP or MIS; it really focuses on what we are doing with technology throughout the company."

Northrop spends an estimated $300 million annually on information systems, 55% of it directly on staff. Northrop has invested more than $2.5 billion in facilities and equipment since 1980, refocusing its resources to position the company for the 1990s.

Howard, who joined Northrop five years ago, is working on a goal set 10 years ago by the company: to design strictly in a three-dimensional computer database.

As a leading design engineering company, Northrop realized it could significantly improve its quality and output by moving to sophisticated 3-D engineering workstations.

Ten years ago, however, there were no 3-D workstations to buy, so Northrop developed a system internally. The first product designed by the new system was the B2 bomber, the first aircraft in history designed totally in 3-D.

Under Howard's guidance, the system went a step further, moving the 3-D capabilities through the manufacturing process and finally into the logistics and support operations. Because of the 3-D capability, Northrop was able to put all its critical processes — design, production planning, fabrication, quality inspection and assembly — on a common database, thus increasing quality and productivity.

In the system's hands

"An airplane is nothing but a bunch of complex surfaces," Howard says. "The key element is the production. If you can do the form and fit on the computer, you don't have to do it manually.

"In the past, the engineer couldn't know something was wrong until he started to build a mock-up. Now the system tells him if he is doing something wrong during the design stage."

At Northrop, people no longer say "back to the drawing board" because they stopped designing on drawing boards in 1984.

Northrop uses the 3-D system, based on IBM mainframes and different types of computer-aided design workstations, on the new Advanced Tactical Fighter project as well. Howard acknowledges that such a system gives Northrop a decided strategic advantage. The company has struggled with the question of whether to offer the 3-D technology for sale in the commercial marketplace.

Several automakers who "would like to get their hands on the system" have approached Northrop, and one organization offered to go out and sell it for the company. After intense internal debate, the decision was made to keep the technology in-house.

Howard instead is focusing on a bigger priority: linking the enterprisewide network together. At Northrop, that means tying design to production and then to logistics and support. Office and administrative computing is considered almost a secondary support function, according to Howard.

An IBM Systems Network Architecture network hooks together most of Northrop's 20,000 personal computers and terminals. While the mainframes are the backbone of the network, Northrop uses equipment from a myriad of suppliers, including HP and DEC. "We face the classic challenge," Howard says. "and that's to get the vendors to help us solve the problems they've created for us."

Northrop realized it could significantly improve its quality and output by moving to 3-D workstations.

In Northrop's distributed environment — there are 24 sites worldwide — the problem is acute. Howard purposely keeps the headquarters staff small. Seventy-five people support the corporate data center. There are 25 director-level executives who essentially manage no one — they are, as Howard describes them, "isolated along functional lines." Their job is to help the divisions develop systems plans.

The directors come from varied disciplines rather than traditional MIS backgrounds.

Howard is quick to point out that despite the decentralized nature of Northrop's information systems function, his group still works as a team. "We find those people with the need and set up cross-divisional teams. We coordinate our efforts so we are not constantly reinventing the wheel," he says.

Tying the entire corporation together is simply not possible. Certain areas are classified and must operate in autonomous, highly secure environments.

Also, Howard says, "There are simply too many different tools that come up in the design phase, and there isn't one vendor who can provide everything we need. But we must have a way of integrating systems."

Howard believes that Northrop is already well on the way to such integration. But much is left to be done. Northrop, a vocal promoter of industry standards, belongs to various committees on Open Systems Interconnect, Manufacturing Automation Protocol/Technical and Office Protocol and other standards-seeking bodies. Howard has drummed up support for an Information Technology Committee within the Aerospace Industry Association, and because he took the lead, he was named the first chairman.

"We have to worry as an industry about how we produce products because our customer, the government, is aggressively setting standards at the same time as the computer industry. We find ourselves caught between a rock and a hard place," he says.

As a major defense contractor, Northrop often operates in varied and changing competitive situations. It may be competing fiercely against a company for one contract and working together with that same company as a co-contractor on another deal.

"We find ourselves with lots of strange little links," Howard says, "and from an information standpoint, it's going to get horrible. You not only need ways to interconnect, but you have to throw on top of that a need for security. On one project, that competing company can't know anything about the project; but on another, they are intimate partners."

As it struggles with the standards question, Northrop continues to invest heavily in computing. The company purchased a former automobile assembly plant in Pico Rivera, Calif., and turned it into a 3.3 million-sq-ft, state-of-the-art center for aircraft weapon systems design, research and manufacturing of the B2 bomber. The Aircraft Division's $43 million Integrated Simulation Systems Laboratory uses computer simulation to help engineers evaluate design options for building advanced aircraft.

With its difficult systems mandate, Northrop must attract and keep good people. Howard claims that this task is not a problem at all. Northrop was included in the book *The 100 Best Companies to Work for in America.* And because it is at the leading edge, the company manages to land top-quality professionals.

"Northrop is known as a good place to work," Howard says. "We have a built-in philosophy that we want the top people, not just bodies. We want the *right* people who will keep us in the lead."

Rifkin is a Computerworld *senior editor.*

Beyond automation: For manufacturing, it's a matter of timing

By Sheryl Kay

Powerful military jets, sleek four-door sedans and rugged farm tractors have one thing in common: None can be produced today without the effective use of information systems on the factory floor.

The significance of information systems to aerospace, automotive and industrial manufacturers requires major investments to automate production and streamline engineering. Companies in these businesses in the *Computerworld Premier 100* spend an average of 2.7% of revenue on information systems. Leaders like **McDonnell Douglas Corp.**, **The Lockheed Corp.** and **Deere & Co.** require budgets of 3.3% to 4% of their revenue.

"These industries compete on the basis of cost, quality and delivery," says Earle Steinberg, national director of manufacturing consulting at Touche Ross & Co. in Houston. "And you must be able to compete simultaneously on the basis of all three, which today can only be achieved through a strong commitment to information technology."

High visibility

Information services is a high-profile group in heavy manufacturing because it automates critical processes. "It all comes down to timing," Steinberg explains. "You have to know what parts flow where and when so you can cost production; in delivery, you have to be able to compress lead times and meet performance schedules; and in quality, you must identify any problems quickly and respond to them even quicker."

Though aerospace companies regard information systems as an absolute requirement, "There is a sensitivity to cost that is more a part of their culture than in other businesses," says Jim Schwendinger, a management consulting partner at Touche Ross.

Many of the aerospace giants began developing premier systems back in the late 1960s, so they are concerned about extensive upgrade costs. "They can't just unplug all of these systems," Schwendinger points out. "They have to go back and replace each system carefully."

Ford's automated assembly line

An important function of information systems in aerospace is to help reduce the time between initial engineering and production. Although some firms still run stand-alone systems, most are moving to computer-aided process planning.

"They don't necessarily need a new graphics package," Schwendinger says, "but they are just beginning to integrate all of the systems' capabilities."

Adds Steinberg, "These companies are generating numerical control instructions directly off their computer-aided design drawings."

Eliminating paper

Systems are also used to coordinate major projects between suppliers, contractors and the government. "We can get rid of some of the paperwork," says Jim Sutter, **Rockwell International Corp.'s** vice-president of information services, "by moving it into electronic form and sharing it between the contractor and the government."

Perhaps the most unique calling for MIS in the aerospace industry is in cost reporting, where the pressure to provide accurate information is several notches higher than in other industries. According to Steinberg, the procedures here are quite different, and MIS seeks answers to different questions than other industries ask.

"In automotive, you collect data that pertains to unit cost," he explains, "whereas in aerospace, you are asking questions that relate to collecting data to comply with government reporting requirements."

As Pentagon expenditure scandals are reported in the news media almost weekly, the cost-reporting burden is becoming extraordinary for MIS. Most contractual agreements with the government are imposing more detailed standards for cost reporting.

Meeting these stricter standards becomes especially difficult, Steinberg observes, when a manufacturer is mixing projects. "Each project is negotiated with costs that have different allocation rules, which require significant changes in the system," he says.

> **"Automotive companies are realizing IS is critical to success."**

MIS continues to grow in importance in the automotive industry, particularly in the past decade. According to Mike Weiner, a vice-president at Index Group, Inc. in Cambridge, Mass., some automotive companies once viewed MIS as the blue-collar workers of management.

"They've gotten some religion now," observes Weiner, "and they finally realize information services is critical to the success of the company."

But Weiner says the industry does not fully recognize the value of MIS. "It takes more than money," he says. "The industry still has not realized that the top MIS executive is going to be an integral member of the corporate management team."

Currently, the industry is focusing on improved quality and cost effectiveness through the use of technology. According to Weiner, "They are very cognizant of the need to reduce the product development cycle."

Like aerospace companies, auto makers are gaining efficiencies from integrating islands of technology.

"The integration begins with our CAD systems in engineering and continues through to the bill of materials, parts procurement, manufacturing and corporate accounting systems." says Jerry Decker, manager of corporate systems planning at **Ford Motor Co.** in Dearborn, Mich.

Ford placed ninth, well ahead of rivals General Motors Corp. (13th) and Chrysler Corp. (18th) in the industry ranking of the *Computerworld Premier 100.*

Graphics use growing

Graphics is one extremely important emerging technology area, especially from the standpoint of moving engineering drawings from one location to another.

Ford is now developing its graphics technology so that there will be a central repository for all drawings. This central system will allow any engineer to access another engineer's drawing for viewing and modification.

Other technologies being explored by automotive and tractor makers include artificial intelligence for diagnostics in the repair shop, vision systems for product design within the manufacturing plant and bar coding for materials management.

Kay is a Tampa, Fla.-based business consultant and free-lance writer.

AEROSPACE, AUTOMOTIVE AND INDUSTRIAL

Industry rank	Company/Location/Total employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**Northrop Corp.** Los Angeles 47,500	3	14,800	$6,053M	$94.2M	$300M
2	**McDonnell Douglas Corp.** St. Louis 109,000	9	13,885	$13,146.1M	$313M	$550M
3	**The Lockheed Corp.** Calabasas, Calif. 98,100	14	13,195	$11,370M	$421M	$400M
4	**Textron, Inc.** Providence, R.I. 66,500	31	11,865	$5,661.4M	$256.3M	$150M
5	**Deere & Co.** Moline, Ill. 37,900	32	11,840M	$4,134.5M	-$99M	$140M
6	**Rockwell International Corp.** El Segundo, Calif. 118,700	34	11,825	$12,123.4M	$635.1M	$450M
7	**Caterpillar, Inc.** Peoria, Ill. 53,800	41	11,450	$8,180M	$350M	$140M
8	**United Technologies Corp.** Hartford, Conn. 191,800	44	11,365	$17,170.2M	$591.7M	$300M
9	**Ford Motor Co.** Dearborn, Mich. 350,320	86	10,325	$71,643.4M	$4625.2M	$836M
10	**General Dynamics Corp.** St. Louis 105,400	90	10,265	$9,344M	$437.3M	$200M

A MAN WITH A MANDATE: TRAVELERS' NEW CHIEF OF SYSTEMS, LARRY BACON

By Alan Radding

A mandate from the top makes information systems the No. 1 priority. The former head of the organization was a high-profile leader who seemed to do all the right things. What more could Larry Bacon, new systems chief at The Travelers Corp., ask for?

Plenty.

Despite a directive from the company's chairman to leverage technology in all Travelers' businesses, there remains resistance at all levels of the organization. In addition, for all that Bacon's predecessor, Joseph Brophy, achieved with information systems, the hardest challenges are still to come.

As Bacon says, "All the easy things have been done."

The Travelers' commitment to using information systems to create competitive products — signified by 9% of revenue spent on MIS — makes it the No. 1 insurance and financial services company and No. 4 overall in the *Computerworld Premier 100.*

Two years ago, Travelers Chairman Edward H. Budd issued a mandate to take advantage of technology in each of the company's businesses as the first of three top priorities. The other two were to make service preeminent within all aspects of the operation and to preserve the company's human resources through the careful cultivation of talent.

While the second two priorities are clearly applicable to information systems as well as every other part of the company, the chairman's first priority singles out information systems management and staff as the driving force of corporate strategy.

"Those are our marching orders," says Bacon, whose title is senior vice-president of data processing and telecommunications.

A 20-year veteran of The Travelers' DP operation, Bacon moved into the top technology slot in April, following the transfer of his boss, Brophy, from MIS to one of the company's major line businesses, employee benefits.

PETER GLASS

The Travelers' Larry Bacon

Bacon inherited a difficult assignment. At Travelers, information systems have long been installed in all the obvious places where they could provide an immediately apparent benefit.

"We already provide the core things — low cost, reliable, responsive systems," Bacon says. "We've cut response time on the network down to 1.2 seconds, and the unit cost is dropping yearly. We've reduced CPU charges 15% a year. We've got a complete set of [basic] applications, as good as any in the industry."

But that isn't enough. The new goal of information systems is to penetrate to the very heart of Travelers' business and operations.

"We're involved in a very complex set of issues: What is the effective use of technology? Where is Travelers going?" Bacon says.

Seen in this light, information systems is no longer just a service but an integral part of

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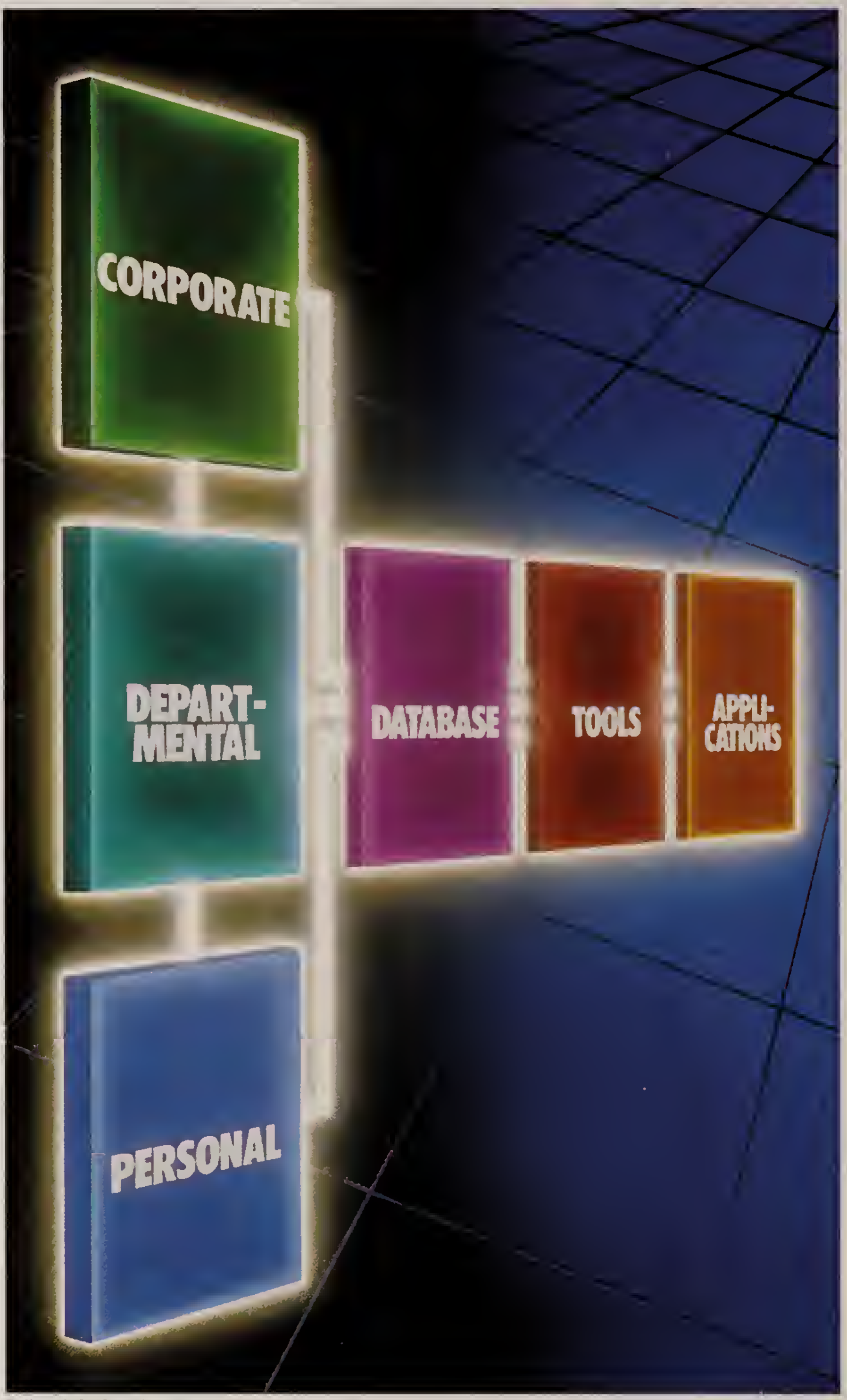

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the organization's business, strategy and goals. Bacon envisions new systems that will take information and put it to work in the organization in different ways. For example, he wants to make as much data as possible available to users who require it for their business functions.

Bacon sees Travelers' Client Access and Risk Management Analysis (CARMA) program as an example of future applications. For years, the company collected detailed information about employee claims submitted by large corporate customers. The CARMA program makes this data available to the client companies so that they can analyze the patterns of losses and take preventive measures.

In the past, Travelers brought computer power to diverse functions of the business. For the future, the goal is to "automate the total process of our changing business. That is an order of magnitude beyond where we were in the past," Bacon asserts.

For example, Bacon foresees expert systems that automate the issuing of policies from the initial customer application through the issuance of the final policy, including the underwriting. If an underwriter is required to step in, the system would automatically communicate with him, Bacon explains.

To implement this level of capability, Travelers looks to artificial intelligence as a key area. Several AI projects that utilize expert systems are already under way, and Bacon reports a growing awareness of expert systems across the company.

Of less interest is image processing. Travelers is trying to get away from paper as much as possible, and Bacon doesn't yet see how image processing helps achieve that goal. "Image processing is another way to store paper, not eliminate it," he says.

Overcoming reluctance to change

To deal with the reluctance to accept the importance of information systems within Travelers, Bacon encourages ongoing dialogue between his group and the other parts of the company. "We're talking about change, inside and outside DP," he says.

Input from the line managers is critical if the company's business groups are to leverage technology successfully. "You can't have DP people invent everything, no matter how well they know the business," he says.

The idea for the CARMA program came from "one of the least technical people," he notes. "He saw a problem, and we sat down and started talking."

Bacon's department is closely structured along Travelers' lines of business. In addition to the basic operations and administrative segments, there are groups aligned with each of the company's business divisions, such as employee benefits or the agency marketing group, which report to Bacon.

While the business systems groups still reside within centralized data processing, they try to function much like a decentralized department. Bacon reports to Tom Thorsen, the chief financial officer, who reports directly to the chairman.

A sign of the greater role of information systems at Travelers is Bacon's frequent reference to bottom-line results. "We've always been concerned with the bottom line, that our systems were contributing and making a difference, but it intensified in the past couple of years," he says.

Radding is a Boston-based author specializing in business and technology.

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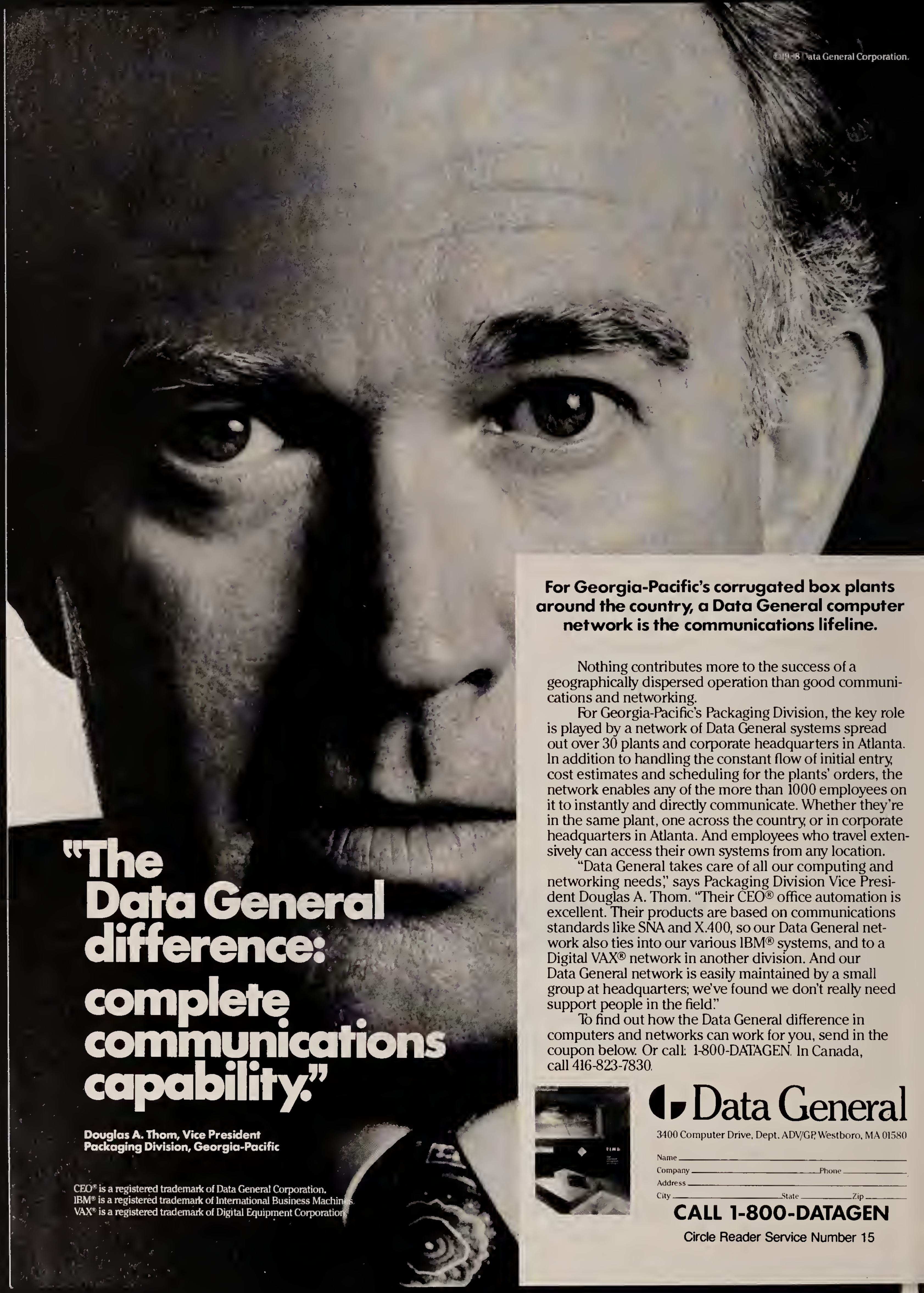

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Circle Reader Service Number 15

Risk-taking keeps financial services ahead of the game

By Suzanne Weixel

Insurance and financial service firms were among the first to adopt PCs.

Betting on the future is a risky business.

But in the insurance and financial services industries, such bets are the only way to gain competitive advantage through information systems.

"Even as a company adopts the newest technology, everyone else in the industry is adopting it as well," says Alex J. Pollock, a former industry consultant at Nolan, Norton & Co. "If a company doesn't try something different, it will be left in the dust."

The top insurance and financial services companies in the *Computerworld Premier 100* spend an average of 3.4% of their revenues on information systems to gain leadership positions.

Risk-taking is the common denominator among these companies, says H. Thaine Lyman, national director of large-scale systems consulting at Touche Ross & Co. in Chicago. Many were among the early birds willing to commit to buying personal computers by the thousands, well before these machines were a desktop way of life.

As a result, the companies own an average of more than one PC or terminal per employee, the highest ratio in any of the 10 industries covered in the Premier 100.

"A number of these companies have spent money on something that, at the time, just sounded like a good idea," Lyman says. "They've broken away from the follower mentality and therefore have assumed leadership roles."

For example, such investments are applauded at fourth-ranked **Metropolitan Life Insurance Co.** in New York. "Top management encourages us to try new technology," says Daniel Cavanagh, senior vice-president of information systems. "Sometimes it leads to failure, sometimes to success. But if you don't try, you can't learn."

Corporate philosophy takes a different tack at fifth-ranked **Teachers Insurance & Annuity Association** (TIAA), also headquartered in New York. Teachers' John Putney, executive vice-president for operations support, dislikes being labeled a risk taker.

Part of the plan

According to Putney, his company makes use of new technologies only if they fit in with business priorities. "We would not jeopardize a business plan just to use a particular technology," he says.

But, Putney acknowledges, if TIAA sees an opportunity to make use of a technology to advance a business strategy, the company jumps on it.

For instance, TIAA operates a voice-activated phone system that allows policyholders to make inquiries and conduct transactions without human assistance.

While voice-activated computers may not be unique to his company, they illustrate the use of technology to introduce the firm's new products. Says Putney, "We can respond faster to customers. So we can offer more products without bogging down."

Competition in the industry is intense. To be profitable, a company not only needs to try something new, it also must figure out how to make it work.

At 10th-ranked **Farmers Insurance Group**, the tool that propels the company's success is an agency computer system that can be accessed by 70% of the Farmers' agents nationwide.

"The agents can service any policyholder, anywhere in the country," says Edward Terhar, vice-president of systems planning. "Other insurance companies provide agents with databases of their clients. We not only include all of the information on all of the policyholders everywhere, we update it daily."

Dual strategies

According to Pollock, now president of Community Federal Savings in St. Louis, most companies, particularly those in insurance and financial services, employ two basic modes of strategic operation:

- Offensive — using technology to do something no one else is doing.
- Defensive — using technology to keep up with the competition.

"There's nothing wrong with operating

on the defensive — as long as you know what you're doing," he says. "You can make average returns using new technology to lower your operating costs. But it's the offensive strategy that gives you the competitive edge."

Many firms use technology to carry out an internal commitment to quality service.

"Our company philosophy is based on service," Terhar says. "Everything we do is driven by the need to support the agents in providing service to the policyholders."

Metropolitan Life's Cavanagh acknowledges a similar philosophy. "Technology for technology's sake went out with the '70s. Now we use it to satisfy customer requirements," he says.

The systems organization must also be very well managed if it is going to help the company's bottom line, says Touche Ross' Lyman. A well-run organization can take on new challenges without disrupting the quality of service it provides.

"Quite often," Lyman says, "internal operational excellence can in and of itself be a strategic advantage."

Thomas Pettibone, vice-president of information services and systems at second-ranked **New York Life Insurance Co.**, agrees. He attributes some of the department's success to its organizational strategy. "We're centralized, but we have found a way to maintain a decentralized focus," he says. "We have placed top systems personnel in each business department to serve as business analysts. They are in a position to bring systems planning knowledge to the business centers on a day-to-day basis."

A well-run firm can take on challenges without disrupting the quality of service it provides.

Pettibone also credits top management's support of long-term technological excellence. "They have made an overt financial commitment to using technology to make us competitive and to keep us competitive," he says.

For example, the company provides a support system that allows agents on-line access to client files.

Currently, Pettibone says, New York Life is nearing the end of a four- to five-year project intended to enhance the company's overall electronic responsiveness.

"Management took a look around and said, 'In order for us to compete in the '90s, we have to do this now,' " he explains.

TIAA's Putney admits that without putting some faith in advancing technology, the company could not achieve its goals.

Referring to an electronic publishing system that lets TIAA customize option information for particular customer institutions, Putney explains, "We couldn't serve our customers so effectively any other way."

Weixel is a free-lance writer based in Framingham, Mass.

INSURANCE AND FINANCIAL SERVICES

Industry rank	Company/Location/Total employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**The Travelers Corp.** Hartford, Conn. 33,900	4	14,600	$3,826.6M	$62.8M	$350M
2	**New York Life Insurance Co.** New York 19,746	23	12,410	$5,596M	$137.1M	$125M
3	**Nationwide Mutual Insurance Co.** Columbus, Ohio 12,000	30	11,935	$6,923.2M	$15.8M	$130M
4	**Metropolitan Life Insurance Co.** New York 38,000	43	11,380	$13,963.8M	$359.9M	$225M
5	**Teachers Ins & Annuity Assn.** New York 3,065	45	11,345	$3,059.7M	$206M	$56M
6	**American Express Co.** New York 81,500	51	11,080	$17,768M	$533.3M	$800M
7	**Primerica Corp.** Greenwich, Conn. 24,800	65	10,820	$3,762M	$198.6M	$120M
8	**Mutual Benefit Life Insurance Co.** Newark, N.J. 4,594	68	10,700	$2,020.7M	$35.4M	$45.4M
9	**St. Paul Companies, Inc.** St. Paul, Minn. 9,832	80	10,410	$3,366M	$324.3M	$105M
10	**Farmers Group, Inc.** Los Angeles 3,900	82	10,405	$6,328.8M	$246.7M	$75M

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INFORMATION TECH PROVES A TONIC FOR ABBOTT LABORATORIES

By Amy Bernstein

The information systems that provide competitive advantage for Abbott Laboratories are so closely guarded that the company recently refused national attention in *The Wall Street Journal.*

Sufficient details of the company's use of technology are known, however, to rank it as the top pharmaceutical company and No. 1 among food and consumer products producers in the *Computerworld Premier 100.*

Kenneth Farmer, vice-president of MIS, leads Abbott's systems organization in its efforts to gain ground in the research-intensive pharmaceutical industry. He commands a $100 million to $150 million information systems budget — approximately 3% of the company's $4.3 billion 1987 revenue — and oversees 21 minicomputer and mainframe sites. Another $100 million to $150 million makes up the installed value of major processors.

Besides hefty spending, keeping MIS staff expenses down to 34% of the budget and providing 6% of the information systems investment for training helps position Abbott as the seventh most effective user of computer systems overall. In addition, 38% of the company's employees have access to personal computers and terminals — another indication of the importance placed on technology.

For Abbott and its peers, which are besieged by competitive and economic pressures, information technology is proving to be the best medicine for continued corporate health. From sales and marketing to clinical trial management, pharmaceutical companies increasingly rely on computers to obtain and analyze vital statistics as quickly and accurately as possible.

"We're witnessing the beginnings of a data explosion in the industry," observes Arthur Anderson's George Smith, an industry consultant.

In three broad areas — some emerging, some mature — technology is helping contain costs and improve productivity, if not actually promote competitive advantage:

- Compressing product development — that is, decreasing the time required to bring a new drug to market.
- Managing information, from clinical trial data to Food and Drug Administration approval processes.
- Delivering and distributing drugs, medical equipment and diagnostic services to markets electronically.

On the research and development front, Abbott, in North Chicago, Ill., was among the first to pursue the area of computer-assisted molecular design — part of an industrywide move toward computer-aided drug design. Traditionally, Abbott researchers could only screen compounds to see how well they worked. Now they can simulate on computers how compounds work, providing more specific molecules with fewer side effects. The approach is not only more accurate but more cost-effective as well.

Used CAD for AIDS test

In another computer-aided drug design effort, Abbott linked chemicals and computerized instruments together to hasten development of the first test to detect AIDS virus antigens; the test is now awaiting FDA approval.

Many drug companies are also adding computer "smarts" to their basic arsenal of scientific instruments. For example, a typical clinical blood analyzer is now also a computer that performs data reduction and interpretation and pipes results directly into a hospital's information system.

THE IMAGE BANK

Pharmaceutical firms use systems to speed development.

Along these lines, Abbott's pharmaco-kinetics computer program helps clinicians interpret and recommend appropriate patient dosing levels. The firm offers use of the program on a fee-for-service basis to customers using its Therapeutic Drug Analyzer system.

So great is the demand for the convenience of on-line order entry that Abbott and other companies provide multivendor purchasing networks. Abbott operates Quiklink, with more than 30 vendors on-line. Competitive advantage here is virtually moot; medical supply networks are rapidly becoming an expected service.

Pharmaceutical firms experiment with optical disks for decision support.

Abbott also operates a computerized drug delivery system that enables hospital pharmacies and other customers to add injectable drugs to their patient intravenous fluids. Abbott's ADD-Vantage drug delivery system is an industry leader and an important element of the company's highly profitable diagnostics division. The system offers 33 different drugs, including five of its own.

The chief advantage of the system for the supplier is fast access to large markets. For instance, in 1987 Abbott introduced an antibiotic, clindamycin, to the ADD-Vantage network. The exposure subsequently helped the company earn a sizable share of the U.S. market for clindamycin. Within five years, Abbott expects ADD-Vantage to be used in virtually every hospital in the U.S.

The industry is also experimenting with optical disk-based text-and-image storage. These systems are being used, for one, as decision support systems that help managers and researchers sort through enormous amounts of information on FDA requirements, commercial rationales for new products, business case development and other aspects of drug marketing.

Optical systems may also eventually be used to send filings to the FDA for new drug applications. The approach may one day replace the 40,000-page paper documents now required, but Smith says it is still very much in the early experimentation phase.

Abbott faces stiff competition from long-established firms, like Smith Kline Beckman Corp., and revived entrants, such as Eastman Kodak Co.'s Sterling Drug, Inc. A key strategy to meet new demands is diversification. Abbott is making aggressive — and lucrative — inroads into the medical testing, or diagnostics, and nutritional formulas markets.

Diversification has implications for cost and efficiency: As the company's drug portfolio expands, so too does its need to access and manage large amounts of data in R&D as well as production, distribution and marketing. Such pressure will continue to increase the importance of information systems to Abbott and others in health care.

Bernstein is managing director of Gavroche Associates, a communications consulting firm in Cambridge, Mass.

FOOD, PHARMACEUTICAL AND CONSUMER PRODUCTS

Industry rank	Company/Location/Total employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**Abbott Laboratories** North Chicago 36,800	7	13,925	$4,387.9M	$632.6M	$125M
2	**Baxter Healthcare Corp.** Deerfield, Ill. 62,500	11	13,725	$6,223M	$331M	$160M
3	**Merck & Co.** Rahway, N.J. 31,100	21	12,535	$5,061M	$906M	$150M
4	**Pfizer, Inc.** New York 40,700	36	11,700	$4,920M	$690M	$125M
5	**Smith Kline Beckman Corp.** Philadelphia 35,000	39	11,605	$4,328.8M	$570.1M	$175M
6	**Sara Lee Corp.** Chicago 89,700	50	11,095	$9,154.6M	$267.1M	$250M
7	**Johnson & Johnson** New Brunswick, N.J. 777,000	71	10,650	$8,012M	$833M	$200M
8	**RJR Nabisco, Inc.** Atlanta 120,334	75	10,485	$15,868M	$1,209M	$240M
9	**Pepsico, Inc.** Purchase, N.Y. 219,500	79	10,410	$11,500.2M	$594.8M	$250M
10	**The Coca-Cola Co.** Atlanta 22,700	84	10,375	$7,658.3M	$916.1M	$100M

Richard H. Shriver, McGraw-Hill's senior vice-president of technology

MCGRAW-HILL TAPS ONE UNIFIED SYSTEM FOR MANY MARKETS

By Connie Winkler

One hundred years after founder James H. McGraw bought his first magazine, McGraw-Hill, Inc. is leveraging its investments in information systems to capture even more business in publishing and communications markets.

But the company recently decided that diversity, while good for business, is bad for systems strategy. Richard H. Shriver, head of McGraw-Hill information systems, was named senior vice-president of technology July 1 to take command of a more centralized organization.

"It was extremely hard to provide a corporate view of technology or corporate oversight and coordination in the previous organization," Shriver says. "There were too many companies, too much autonomy; today there's commitment to work on a centralized basis."

With a systems budget that is about 7% of annual revenue, McGraw-Hill makes one of the largest investments in information systems for a company its size, causing it to rank above other service companies in the *Computerworld Premier 100.*

The systems reorganization is part of a corporate restructuring that combined a half-dozen market-focused companies into three main ones.

"All three companies have great opportunities and challenges in the marketplace, all totally different. My personal objective," says Shriver, from McGraw-Hill's midtown-Manhattan headquarters, "is to leverage the company's technology skills across organizational boundaries."

One of the most powerful ways McGraw-Hill's information systems capabilities will be used is to provide a pipeline through which all the company's real-time and on-line products can flow directly to internal corporate networks. "We are closer to accomplishing that today than we have ever been before," Shriver says. "The consolidation will allow us to focus on the remaining problems."

By providing integrated systems between divisions, the systems group will be able to meet customers' requirements for one access point for the company's services.

"Large companies with internal networks want a way to tap into our services and take only what they want without spending too much," Shriver says. "Now they have to spend time going through what they don't want, and they pay a fair amount of money to

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do it, not just for our services but others as well."

McGraw-Hill is not the only information services company that sees this market opportunity, but it hopes to get there first. "We're working on that opportunity in ways I can't talk about," Shriver says. "But they will be reflected in the projects we will be producing in the future."

The reorganization will also allow Shriver to assess the technology resources of the company, providing insight into better ways to leverage the skills at hand.

Some autonomy remains, however. Product development groups still make their own decisions, but capital investments over a certain amount require Shriver's sign-off. Shriver also started and will chair regular technology review meetings with the technology chiefs of the three companies.

The companies are: McGraw-Hill Publishing Co. (book publishing, *Business Week* and TV stations); McGraw-Hill Financial Services Co. (Standard & Poor's Corp. and Data Resources); and McGraw-Hill Information Services (which includes construction, computer and communications, legal, aerospace and defense, health care and energy and process industries groups).

Last year, the company's revenue totaled $1.75 billion, yielding a net income of $164 million; however, McGraw-Hill in the last year was plagued by jumpy stock prices, takeover rumors, acquisitions and sell-offs, and corporate shuffles.

A tribute to Ticker III

Among the company's systems accomplishments to date, Shriver rates Standard & Poor's Ticker III, the real-time financial data service, as the most successful. This tribute is particularly due to the Ticker's performance on Oct. 19, 1987, when 604 million shares were traded.

"We think we were the only pricing service that made it through without serious mishap," Shriver says. "We're in the business of supplying stocks and options to traders; a second can mean the difference between profit and loss."

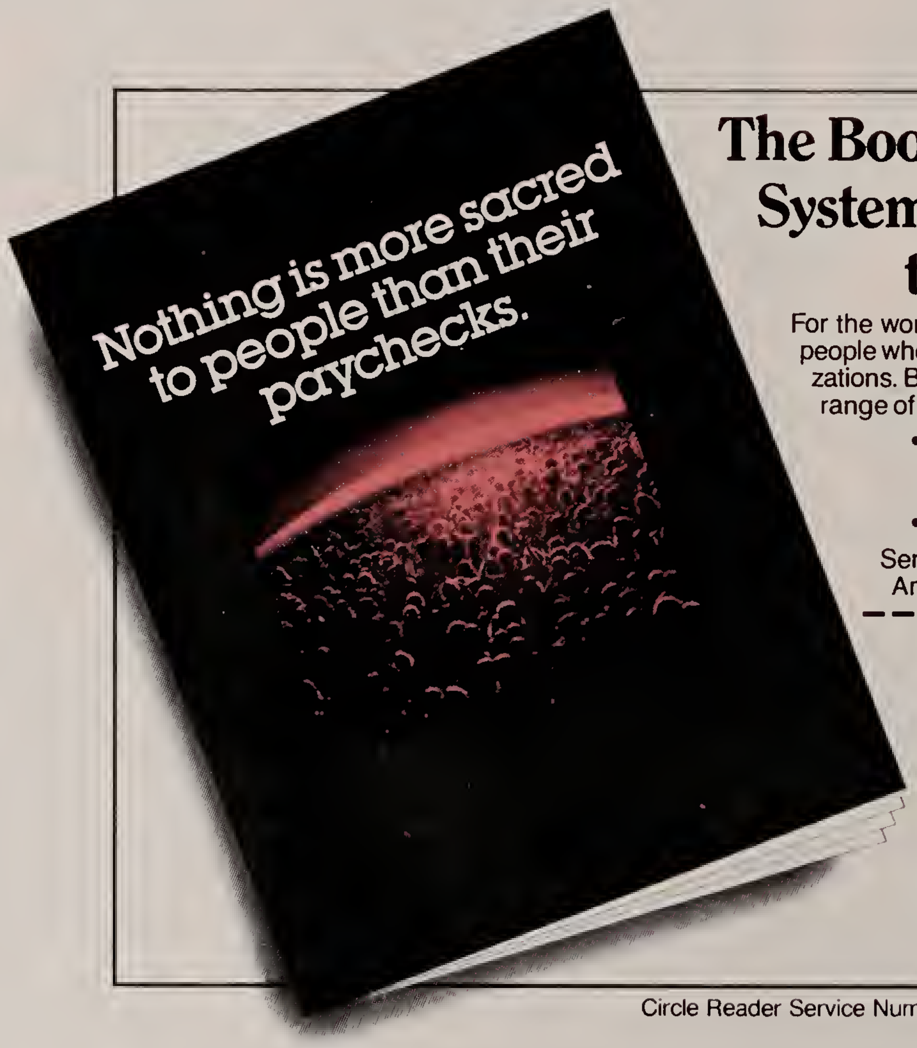
Standard & Poor's and McGraw-Hill use networks to keep Ticker and Marketscope, the real-time financial information service for brokers, up and running. There is redundant communication to the data center, much of it based on microwave.

Apart from integrating systems, McGraw-Hill is also trying to deliver data no matter what equipment the customer uses. "The customer doesn't want 11 terminals on his desk to get prices," Shriver says.

Standard & Poor's financial products are not the only ones being put through the technology Cuisinart by McGraw-Hill product developers. A bond information service, bits and pieces of which were variously available — such as the Standard & Poor's Blue List, traditionally printed on blue paper — is now available electronically.

McGraw-Hill also provides products on popular compact disk/read-only memory (CD-ROM) disks, including the long-standing *McGraw-Hill Encyclopedia of Science & Technology.* Standard & Poor's Compustat database of corporate financial information is available on CD-ROM for personal computers so data can be readily transferred to PC applications, such as spreadsheets.

Winkler, former New York bureau chief for Computerworld, *writes about information strategies and management technology.*



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- 23. Dir, Mgr, Suprv, Analyst, of Systems
- 31. Dir, Mgr, Suprv, of Programming
- 32. Programmer, Methods Analyst
- 35. Dir, Mgr, Suprv, OA/WP
- 38. Data Comm Network/Systems Mgt

OTHER COMPANY MANAGEMENT
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In transport, getting it from here to there is no longer enough

By Michael Ball

The gentlest way to describe information systems managers in the transportation and other services industries may be "alert." Carriers of people, parcels and information are running hard to keep up with one another and with demands from customers.

Leading the pack among major airlines is **AMR Corp.**, the parent of American Airlines, in Fort Worth, Texas. AMR ranked second among transportation and other services companies in the *Computerworld Premier 100,* several steps ahead of direct competitors Texas Air (No. 12 in the industry and 158th overall) and United Airlines (No. 14 in the industry and 166th overall).

Factors contributing to American's leadership position are information systems spending, totaling 5.5% of revenue compared with industry average spending of just greater than 4%, and a better than 1-to-1 ratio of personal computers and terminals to its more than 60,000 employees.

While airlines are often measured by how long passengers wait before their plane takes off, their information systems are embroiled in pitched battles over reservations systems. Points are scored in the competition based on precision-data juggling for reservations, baggage routing and tracking.

Similarly, in the package delivery end, simply getting the goods from point Y to point Z on time is not enough anymore. The services are in a frenzy of competition to provide fuller, faster, more frugal service.

"Competitors were offering technology to customers, and we suddenly found that we had to, too," says Frank Erbrick, **United Parcel Service's** vice-president of information systems. "You can only ask people to work so fast, and the rest of it has to come from technology."

On both sides of the industry, the short timing and high transaction rates put dual pressures on information systems. None of the goals is possible without computer-based technology fixes. One set of systems is aimed at effectiveness — measures and methods that make possible key services such as gate control and package tracking. Another set is for efficiencies. Systems staff is charged with locating waste and redundancy, pointing the way to lower cost operations.

Federal Express' packaging center

The systems side of transportation companies must hit the ground running every day — particularly for airlines, which are still adjusting to deregulation and consolidation.

The pressure mounts

The stresses will only build, says George Rusznak, an industry analyst at the Index Group in Los Angeles. "There is a lot of pressure to be efficient and to deliver high-quality service."

For the airlines' information systems groups, this pressure means the following:

- Developing and continuously fine-tuning reservations systems with upwards of 50 million flights and fares.
- Maximizing each flight's yield of revenue per passenger.
- Managing passengers, fuel, luggage, freight and gate traffic.

The winners will be the ones that use systems to balance cost and quality concerns best during the next few years, Rusznak says.

One of the ironies is that growth almost always means loss of ability to manage quality. For example, Rusznak cites Scandinavian Airlines, which is wrestling with the issues. Two years ago, the new chief executive officer of the firm decided it needed to compete on service to reverse an $80 million loss. He eliminated some middle managers and gave service providers such as flight attendants authority to manage passenger requests.

The result was a $30 million profit within one year but a loss of control over costs. The firm is now trying to balance service and size without losing profit.

"The only way to fix this is with technology," Rusznak says. "You need to redesign the control system without the traditional hierarchical structure of organization. You need to maintain control without a large number of supervisors and middle managers."

On the way to solving such seminal problems, the systems people still have to help run the airlines. In AMR's case, this responsibility means dealing with the myriad mundane concerns of American and the separate

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Circle Reader Service Number 20

issues of its Sabre reservation system.

Sabre is a separate $405 million division, the largest of five reservations services used by travel agents throughout the country. Yet it is also a marketing tool, reinforcing American Airlines' presence and the perception of customer service.

The systems issues for Sabre are plain, according to AMR's John Hotard, senior representative of corporate communications. "We have 43 million fares in it, with up to 1.5 million changes a day. There is no way to track these without computers," Hotard comments.

> **"You can only ask people to work so fast; the rest of it has to come from technology."**

Catching up

Even more obvious effects of systems' importance in the industry became unmistakeably apparent to UPS' managers in Paramus, N.J. "In 1985, we became aware there were other carriers," Erbrick quips. "We were unequivocably too slow in responding to what the public saw as value-added services," he adds. "That year, there was a board-level decision to reorganize."

In the package delivery end of the business, the decision meant proving that UPS could match **Federal Express Corp.**, as well as other carriers, in providing systems services. Competitors were providing customers with data in forms and varieties their individual computer systems could use, including sophisticated billing and tracking.

Then, UPS upped the ante with plans to spend $1.3 billion dollars on systems by 1992.

Despite its new commitment to systems, UPS ranks eighth among transportation and other services companies in the Premier 100, with systems spending at about 4% of revenue.

Federal Express shows up three places higher, partly on the basis of investing 5.4% of revenue in information systems. Even more drastic is the difference in overall rank — Federal is 61st on the list, compared with UPS' 106th position.

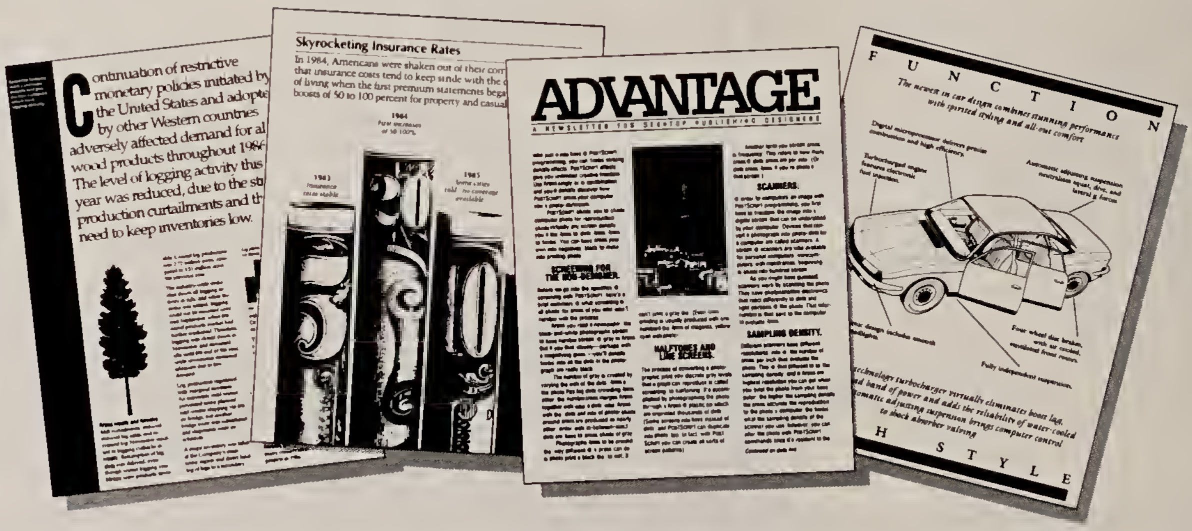
UPS' "catch-up-and-surpass" program includes 22 initiatives, each one a major systems project. One project is an international package brokerage scheme designed to make such traffic as "simple and transparent as shipping from Pennsylvania to New Jersey," Erbrick says.

In pilot stage now, the project places all content, destination and other package data on the outside of the box or envelope. Customs gets the data in advance and specifies which items it will check. These are routed for inspection automatically, with the intent of taking hours or even days off arrival time. The program was two years in the making and will be introduced internationally in October.

Erbrick gleefully states that such programs "will give us a great competitive advantage." However, he admits that "the lead times on such systems are so difficult; some require you to bet your company on the decision."

Ball is a free-lance writer based in Boston.

Freedom of Press.



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Industry rank	Company/Location/Total employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**McGraw-Hill, Inc.** New York 15,600	12	13,295	$1,751.2M	$164.8M	$125M
2	**AMR (American Airlines)** Dallas 59,700	18	12,720	$7,198M	$198.4M	$400M
3	**CBS, Inc.** New York 6,900	58	10,915	$2,762M	$452.8M	$40M
4	**Time, Inc.** New York 5,400	60	10,885	$4,193.5M	$249.8M	$60M
5	**Federal Express Corp.** Memphis 46,300	61	10,840	$3,522M	-$65.6M	$190M
6	**Dun & Bradstreet Corp.** New York 59,000	63	10,830	$3,359M	$393M	$50M
7	**Capital Cities/ABC** New York 20,000	88	10,270	$4,440M	$279.1M	$60M
8	**United Parcel Service of America** Greenwich, Conn. 191,600	106	9,655	$9,682.2M	$784.2M	$400M

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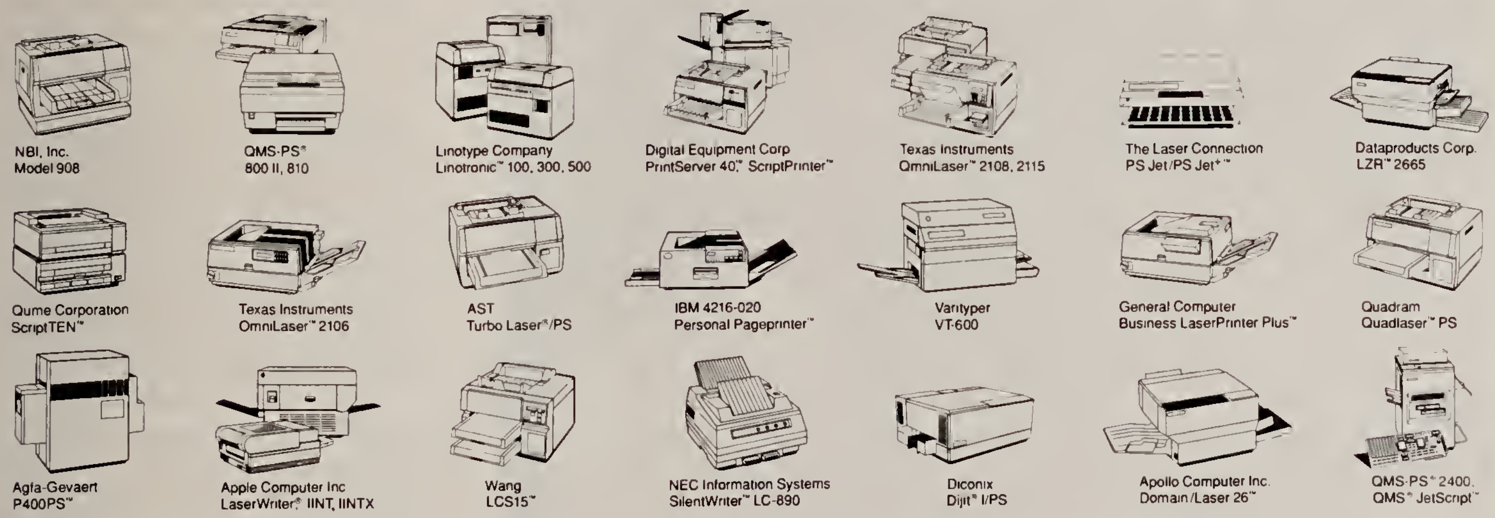

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Circle Reader Service Number 21

DOW MOVES SYSTEMS TO GREATER CORPORATE ROLE

By Michael Sullivan-Trainor

Already advanced in applying computer systems to produce breakthroughs — such as biodegradable plastics — Dow Chemical Co. is awakening to the use of technology for strategic advantage.

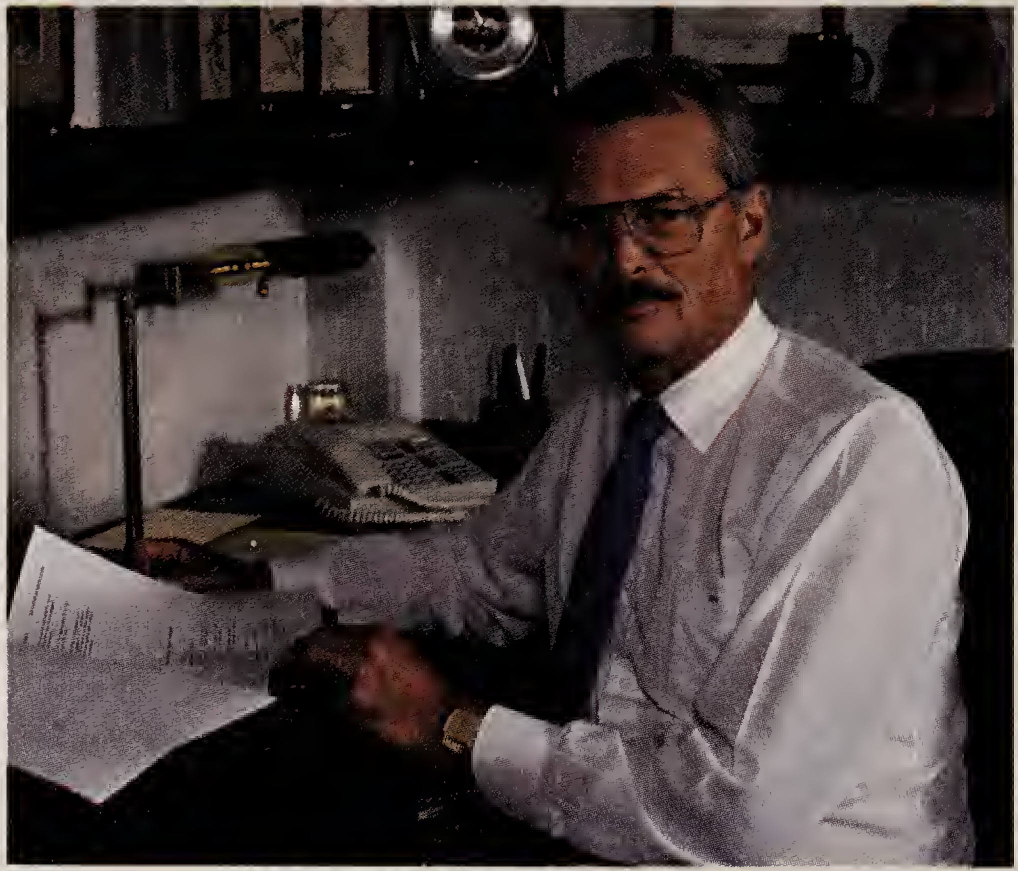
The $13.4 billion company is giving information systems a higher profile on the way to providing the organization with a greater role in business planning. Once falling under the jurisdiction of vice-president of engineering and manufacturing, information systems now reports to the president of the U.S. division.

"Seven months ago, we moved out from under the line function," says Hans Huppertz, director of information systems and communications services. "The executive committee recognized the need to see how we can make better use of information systems."

Currently, the information systems department is charged with a major task — redesigning order-entry systems to speed response times to customer purchase requests. The project is key to establishing the organization's credibility outside of development and production.

Dow, based in Midland, Mich., ranks No. 1 among chemical companies in the *Computerworld Premier 100* and No. 13 overall. The company spends an estimated 1.8% of revenue on information systems, which is below the industry average of 2%. In fact, No. 3 in the industry, E.I. Dupont De Nemours and Co. spends an estimated 2.5% of revenue on systems.

However, two factors contribute to Dow's higher ranking: profit increases of $683 million in 1986 and $499 million in 1987 — bringing total profits up from a low of $58 million in 1985 to a high of $1.2 billion last year — and owning nearly one terminal or personal computer for every two of its 52,000 employees, a setup that provides broad access to technology.



DAVID KRYSZAK

Hans Huppertz, Dow's director of systems

The large percentage of PCs within Dow is attributable to a commitment to sophisticated computer-aided engineering (CAE) workstations in research and development and manufacturing and plant design.

Moving to supercomputing

In R&D, chemical modeling and molecular design are accomplished using systems linked to an IBM 3090 processor with vector capability. Eventually, this system may be replaced by a Cray or a similar supercomputer, Huppertz says.

In plant design, three-dimensional CAE systems are used to reduce drafting costs and increase the speed of the process. Since chemical product developments are closely tied to production requirements, plant design involves the integration of processing, product and construction groups.

The engineering and design workstations are a combination of Intergraph, Autocad and PC-based products, many of them driven by DEC VAX and Microvax computers.

While the CAE projects are in place, the order-entry system is now being developed.

"The system is part of our emphasis on providing quality service," Huppertz says.

Currently, when customers call in to place orders, they must wait to receive a call back from a sales representative to notify them if the company has sufficient inventory to fulfill their order and let them know when it will be shipped.

When completed, the new system will process all calls at a central order service center. Sales representatives will use a central database to view a profile of the customer and check product inventories.

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delivery would best meet the customer's needs.

"It will allow us to provide a quicker response and make adjustments to the volume of our inventory based on the orders we receive," Huppertz says.

When the application is in place early next year, the order-entry centers will be consolidated from six to one. Huppertz is using a combination of his staff and outside contractors to develop the system. He is also buying modules of the application from outside vendors. "We're trying to bring the system to the market quickly," he says.

Another area of development at Dow is a worldwide voice and data network, which provides a backbone for the company's electronic mail system. The network requires linking a diverse array of Digital Equipment Corp. and IBM equipment.

"We've always been a two-vendor company," Huppertz adds. "We will never be all DEC or all IBM."

The DEC systems are more popular with engineering, research and manufacturing departments, while IBM mainframes are operated for large number-crunching applications. "Over time, we hope to come up with a common systems approach with common applications that use both kinds of systems," Huppertz says.

Dow runs 14 to 15 large data centers. "We'll have an IBM mainframe in each center and a cluster of DEC equipment in a room next door," Huppertz says.

Electronic data interchange (EDI) is also an important systems area at Dow, which does business with Ford, a major EDI advocate. Sixty key suppliers are using EDI to work with Dow, which uses third-party EDI services.

Currently, there is a drive to sign up customers on-line along with suppliers. Six are currently using EDI at their sites.

> **"We've always used two vendors. We will never be all DEC or all IBM."**

Expert systems is one technology that Dow refuses to implement on a large scale. There are some two dozen expert systems in applications such as process control and diagnosis, but the jury is still out on how useful they really are. "We're not like a Du Pont that has gone way out ahead in expert systems. We're still trying to understand what they can do," Huppertz says.

On the other side, Du Pont is less interested in engineering workstations than Dow. Huppertz suggests that technology champions in development at the two companies each choose their favorite types of systems.

Improving productivity is an important strategy at Dow, which presents income-per-employee figures in its annual report. For 1987, an all-time high of $43,100 of income per employee was reported.

"Information systems is, in part, responsible for productivity increases," Huppertz points out.

Traditionally, productivity improvements were achieved through automation. In fact, five years ago, Dow's systems organization was much more involved with reducing costs. Today, Huppertz's organization is also measured by its ability to improve the company's market share.

"Information systems came up through the clerical side of the company. But today, we are focused on what is strategic to the company," he says.

The strategic emphasis is composed of goals such as improving quality, increasing productivity, lowering costs, enhancing management's efforts and differentiating customer services from those of leading competitors.

The order-entry system, CAE workstations that facilitate the integration of multiple departments and the worldwide network are the systems tools Dow is using to achieve its goals.

Out of such support comes new developments like the chemicals to allow the creation of biodegradable plastics.

"We have a lot of computing capability in the research and development areas," Huppertz says.

Sullivan-Trainor is Computerworld's *special projects editor.*

CHEMICALS

Industry rank	Company/Location/Total Employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**Dow Chemical Co.** Midland, Mich. 52,200	13	13,215	$13,377M	$1,240M	$250M
2	**American Cyanamid Co.** Wayne, N.J. 34,267	37	11,695	$4,166M	$276M	$75M
3	**E.I. Du Pont De Nemours and Co.** Wilmington, Del. 140,700	52	11,030	$30,468M	$1,786M	$775M
4	**Monsanto Co.** St. Louis 50,700	59	10,890	$7,639M	$436M	$160M
5	**Union Carbide Corp.** Danbury, Conn. 43,119	69	10,675	$6,914M	$232M	$125M
6	**W. R. Grace & Co.** New York 40,000	140	8,740	$5,046.3M	$173.1M	$90M
7	**Ethyl Corp.** Richmond, Va. 10,300	165	8,005	$1,720.3M	$193.3M	$19.8M

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Circle Reader Service Number 23

BANC ONE INVITES YOU TO THE BANK OF THE FUTURE

By Michael Sullivan-Trainor

Behind every successful bank marketing scheme is the computer that makes it work. At Banc One Corp. this generalization is gospel.

To differentiate itself from competitors, the Columbus, Ohio-based bank is experimenting with a "branch of the future." Located on Saw Mill Road in Columbus, the local office features bright-blue neon signs with curlicue letters proclaiming banking services. The resemblance to a food store or clothing outlet is purely intentional.

"Nobody likes to go to the bank," says David M. Van Lear, president of Banc One Services Corp., the bank's information systems subsidiary. "They want to go shopping or to the movies but not the bank. We're trying to change that."

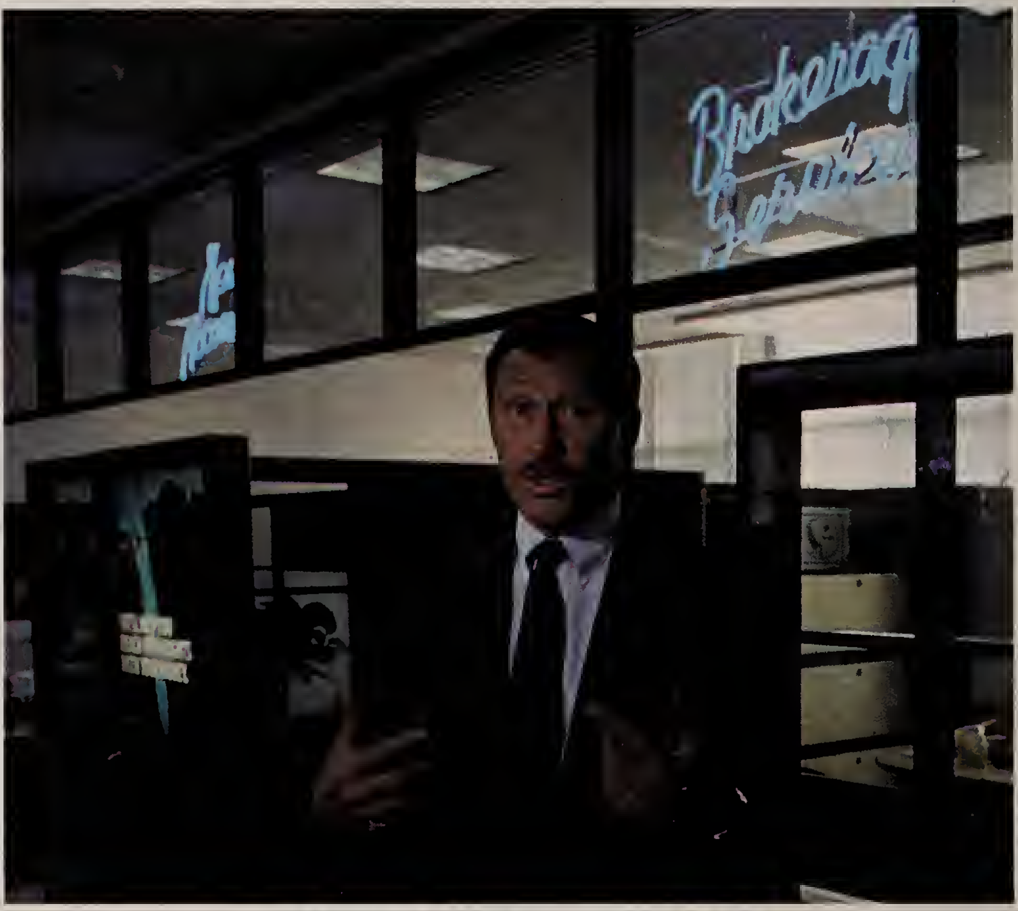
Big risk

Challenging the traditional view of banking with a jazzy presentation is a marketing risk. But the information systems needed to turn the branch of the future into the bank of the future represent a greater technology risk.

"If you're really going to try new ideas, you have to take them to the stage where you develop them and offer the new products to the market," says Van Lear, echoing a corporate philosophy expounded by Banc One Chief Executive Officer John B. McCoy.

Banc One's corporate culture encourages experimentation and is proving to be fruitful ground for information systems: The bank ranks No. 1 in its industry — above larger peers like Citicorp and Chase Manhattan Bank — in the *Computerworld Premier 100.* Strong profits, solid MIS training and personnel expenditures and an information systems budget that exceeds 7% of income are the reasons why Banc One outdistances its rivals.

The Saw Mill Road experiment is a good example of where business-directed technology investments can lead. Standing atop a former cornfield, the year-old branch provides intelligent terminals at every account manager's desk and teller location. Charts, marked with brilliant yellow arrows, show customers the "best buys" of the day in the form of investment opportunities.



ANDY SNOW

David Van Lear, president of Banc One Services

To choose the best buys for its customers, Banc One employees rely on applications that assess current market conditions and possible future scenarios.

The intelligent terminals are the technology platforms for a new generation of distributed banking applications currently being developed by Banc One. Cross-Sell Manager is one such application already being rolled out to the branches. The system automatically identifies which Banc One services meet the needs of the customer based on a profile supplied by the account manager.

"We can analyze the data at the personal computer level, and the application will recommend the products," Van Lear says, "It reduces training time and the amount of individual knowledge required for our employees."

Cross-Sell Manager is the first phase of a much more ambitious undertaking that will transform the way Banc One operates. In the fourth quarter of this year, the systems group will introduce the core products of the applications overhaul. The project, called Future System 90, is a joint venture by Banc One, Norwest Corp., which ranked second among banks in the Premier 100, and Electronic Data Systems (EDS), a General

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Norwest and Banc One provide their financial industry expertise and the test beds to market the applications, and EDS contributes the technical expertise, large project leadership and coding capabilities. "I'm not sure any one banking organization can separately handle all the needs of the financial services industry," Van Lear says.

Future System 90 is more than just a reworking of Banc One's host applications. The strategy calls for the design and implementation of applications that push data and functionality to the lowest level in the organization. "There has got to be a different set of applications to deliver financial information services. We are not meeting the needs of the corporation today," Van Lear says.

The core product of Future System 90, Customer, will contain all the data about any bank customer based on all the products the customer has purchased. Access to all customer data in one place and the full functionality to manipulate it at the PC level will allow employees to better meet customer needs and market products. The change will also take a great deal of the processing burden off of the information systems organization and give it to the users.

"It will enable an account manager to see that someone's car loan is nearly paid and offer that person information about our attractive loan rates when the customer is thinking about a new purchase," Van Lear says.

The only constant

While turning the architecture upside down, Banc One's information systems staff is also supporting a company that is doubling in size every two years. Banc One finished 1986 with assets of $10 billion. Today, assets total $24 billion.

One key to coping with growth is anticipation. Expecting a Milwaukee bank to be acquired by Banc One last year, the information systems staff prepared to extend the T1 network in advance. The acquisition became official on April 1 and the network was in place by April 15.

Another factor that keeps growth under control is the Uniform Product Committee made up of representatives of all Banc One's departments. The committee defines the features and functions for all Banc One products and sets standards to guide their implementation. This leadership gives newly acquired companies a blueprint to follow in adapting to Banc One's operations.

Though Banc One is moving to a distributed architecture, Van Lear plans to keep his IBM mainframes. Their role will change from batch processing to file servers and network managers. Currently, the bank runs four 3090 series systems, a 3084 and a number of 4341 and 4381 processors in regional locations.

Mid-range processors, such as IBM's AS/400, are also part of Van Lear's plan to provide intermediate processing or backup functions to the mainframe work load. Soon there will be no room for dumb terminals, however. The distributed architecture requires intelligent microprocessors such as IBM's Personal System/2.

How successful will Banc One's latest experiment be? So far, no other bank in this country has implemented what Banc One, Norwest and EDS are planning to deliver by the end of next year.

Sullivan-Trainor is Computerworld's *special projects editor.*

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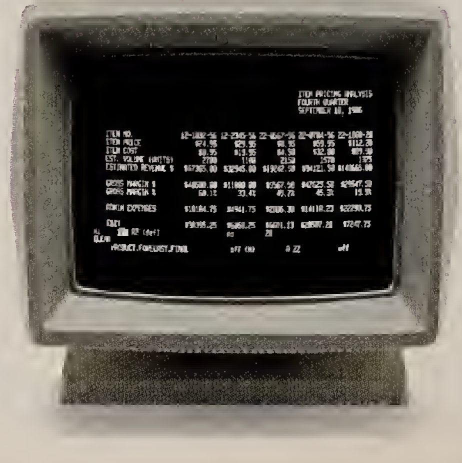

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Circle Reader Service Number 26

Banks must match business goals with systems strategy

By Suzanne Weixel

Remember life before automated teller machines? No cash on weekdays after 4 p.m. No cash at all on weekends. Running all over town to find a branch office. Actually carrying traveler's checks.

ATMs simplified life for nearly everyone. Except possibly the people responsible for keeping those ATMs technologically up to speed.

Even as banking information systems professionals today try to come up with new technological advances, they are realizing that technology is changing the very basics of the way their banks do business, says Charles Christy at Arthur D. Little, Inc. in Cambridge, Mass. One customer no longer equals one account. Now in processing a transaction, Christy says, a bank must consider the total scope of a customer's financial situation.

"A transaction no longer goes directly to a particular account; it goes to a relationship," he says.

The relationship may include checking and cash management accounts as well as home equity and car loans. How the bank does business with the customer depends on the relationship among these accounts.

Convincing upper management that information systems is the best way to manage these accounts is the first step in making use of systems for competitive advantage.

As Thomas Steiner, a partner at McKinsey & Co. in New York, explains, "Information services is a critical function that supports strategy in the banking business. But excellence in information services won't lead to excellence in business performance unless the fundamental business strategy is right."

Information systems spending is a key criterion to measure management's commitment. The top 10 banks in the *Computerworld Premier 100* invest a whopping average 4.9% of income in information systems budgets — the largest percentage investment of all the industries. Another average 2.2% of income represents the installed value of major processors.

As important as the amount spent is the way it is invested. Banks listed in the top 10 purchased an average of one personal computer or terminal for every two employees. They also spend nearly 35% of the average information systems budget on staff and another 3.5% on training.

An example of the match between business goals and systems direction can be found at **Home Federal Savings & Loan** in San Diego, ranked seventh among the top 10.

For instance, one of Home Federal's business goals is to process mortgage loan applications as quickly as possible. To meet this goal, the systems department implemented a microcomputer-based network for its field loan representatives. The representatives can sit down with a customer at his home or office and fit a program to his needs, finding the exact type of loan that best suits that customer. The application also lists exactly what paperwork must be done for the type of loan chosen.

"This system lowers the cost of application and speeds up the process," Chief Information Officer Edwin Nichols says.

Home Federal also uses microcomputers to provide its branches with access to a central information file (CIF).

"Our primary commitment in information services is to provide employees with access to the information they need to best administer banking services to customers. Tactically, it is very important to maintain a high level of systems availability even as we explore new technologies," he adds.

The branches require unlimited access to the CIF, and, according to Nichols, the system is available 99.6% of the time.

PCs for branches

At Home Federal, systems support also includes microcomputer-based sales tools for branch managers. The PCs provide access to daily reports as well as training programs that are downloaded to every branch. Home Federal will also soon offer its branches

Banks must do more than implement ATMs

knowledge-based systems that have the capability of reducing application processing times for mortgage loans and provide sales representatives with "what-if" analysis tools.

Nichols points out that "throughout the past seven to eight years, we have received full financial commitment to continue existing projects and to begin new ones. When we need to grow, we receive the resources we need."

The same cannot be said, however, for other areas of the bank that are facing budget limitations. "Executive management continues to invest in information technology even through tough times," Nichols says.

Signifying management's commitment, Home Federal spends 4.1% of its revenue on information systems.

An expanding view of systems at **Corestates Financial Corp.** in Philadelphia — ranked fourth among its peers — is leading to the development of new profit centers. About 40% of the company's total earnings originate from transaction product services, according to Robert Gilmore, executive vice-president of Corestates Technology Group.

Corestates spends an estimated $60 million annually on information systems to run one of the largest shared ATM networks in the country and the largest bank-provided point-of-sale services network.

The systems group views itself as a product and customer service organization, focusing on developing products for consumer, corporate, international and domestic banking markets.

"We owe our success to identifying opportunities for products," Gilmore says.

Boosting productivity

As at No. 2-ranked **Norwest Corp.**, which is located in Minneapolis, the focus is on improving productivity as well as increasing sales. Norwest's information services department provides mid-range and microcomputer-based technology to the branches. Employees access the host computer for information on individual customers and customer relationships.

During the past five years, Norwest has undergone restructuring in all departments, due in part to a move toward more centralized control of smaller banks it acquired. "Everything we do is designed to meet Norwest's business requirements. We work extremely close with the banking heads," says John Geiken, manager of information services.

Geiken reports directly to the corporate executive vice-president of technology, who in turn reports directly to the organization's chief operating officer. Although there is no chief information officer per se at Norwest, the vice-president of technology performs that function.

Support for information systems within, according to Geiken, is evolving in large part because of an enlightened management. "But it is a two-way street. Just as management has spent some time learning about technology, the information services people have taken the time to learn about the business," he says.

Weixel is a free-lance writer based in Framingham, Mass.

BANKING

Industry rank	Company/Location/Total employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**Banc One Corp.** Columbus, Ohio 13,300	24	12,400	$1,960M	$208.9M	$150M
2	**Norwest Corp.** Minneapolis 15,900	29	11,975	$2,298M	-$29.8M	$110M
3	**Bankamerica Corp.** San Francisco 64,000	46	11,275	$9,753M	-$955M	$500M
4	**Corestates Financial Corp.** Philadelphia 7,700	49	11,160	$1,449M	$162.3M	$60M
5	**Citicorp** New York 89,300	54	11,020	$27,519M	-$1,138M	$1,500M
6	**First Union Corp.** Charlotte, N.C. 19,800	57	10,975	$2,626M	$283.1M	$120M
7	**Home Federal Savings & Loan** San Diego 43,000	70	10,650	$1,258M	$100.3M	$52M
8	**First Chicago Corp.** Mt. Prospect, Ill. 13,700	72	10,600	$4,245M	-$570.7M	$200M
9	**Manufacturers Hanover Corp.** New York 29,700	85	10,350	$7,757M	-$1,140.2M	$380M
10	**First Wachovia Corp.** Winston-Salem, N.C. 13,100	97	9,925	$1,796M	$176.6M	$50M

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AMOCO'S SHREWD STRATEGY KEEPS IT AHEAD IN TOUGH TIMES

By Amy L. Bernstein

Until prices peaked and oil demand began to decline in 1981, industry leaders gave little thought to draconian measures of economy. But today, wide fluctuations in crude oil prices, lower U.S. petroleum consumption and deregulation are forcing oil producers to trim the fat.

This once invulnerable industry now pours money and energy into protecting against uncertainty and further down-cycles. Finding innovative ways of more efficiently managing assets growth is as important as straight cost-cutting.

Nowhere is organizational change more apparent than at Amoco Corp., the nation's seventh largest producer of crude oil, with 1987 revenue of $22 billion. According to Richard M. Morrow, chairman and chief executive officer, the "vagaries of the supply-demand equation" are prompting a major restructuring effort designed to position the company for an era in which there is "little prospect for price-induced growth."

John Reid, Amoco's general manager of systems

JERRY KALYNIUK

Information technology plays a key role at Amoco in enabling it to improve profitability in the wake of consolidation. In fact, Morrow singles out technological expertise, along with cost control measures and global expansion, as the key strategies that will guide future performance.

Amoco's ranking as the No. 1 petroleum producer in the *Computerworld Premier 100* testifies to the company's application of computer technology. While its information systems spending of about 1% of revenue is no higher than its peers', Amoco's recent earnings growth and its spending on MIS employees earn it a 40th-place rank among the most effective users of technology nationwide.

Though smaller overall than either Exxon Corp. or Mobil Corp., Amoco is generally acknowledged as a shrewd player when it comes to deploying technology — whether providing timely drilling data to managers out in the oil fields or assessing the exploration potential of the 11.4 million net acres it is about to acquire through the $4 billion acquisition of Dome Petroleum Ltd. in Canada.

On the upswing

Indeed, Amoco's senior management team strongly backs a wide range of initiatives for improving production profitability and facilitating restructuring efforts in both the upstream — exploration and production — and downstream — refinery management and marketing — sides of its business. Though quantitative results from these initiatives are hard to come by, Amoco's rosy earnings picture in 1987 — when total revenue rose 11% from 1986 — are in part the result of increased operating efficiencies.

Leading Amoco's broad-based information technology initiatives is John R. Reid, general manager of information systems and a 20-year Amoco veteran. Reid says that within Amoco, there is currently an extraordinary amount of pent-up demand on the part of users for systems development support. This demand stems, in large measure, from the downsizing that Amoco and other oil companies have gone through in recent years. With fewer individuals to perform

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Industry rank	Company/Location/Total employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**Amoco Corp.** Chicago 46,800	40	11,515	$20,174M	$1,360M	$200M
2	**Unocal Corp.** Los Angeles 18,100	48	11,205	$8,466M	$181M	$125M
3	**USX Corp.** Pittsburgh 53,500	56	11,010	$13,898M	$219M	$175M
4	**Sun Co.** Wayne, Pa. 23,100	64	10,830	$8,691M	$348M	$125M
5	**Pennzoil Co.** Houston 6,200	73	10,600	$1,786M	$44M	$33M
6	**Atlantic Richfield Co.** Los Angeles 26,200	83	10,385	$16,281.4M	$1,224.3M	$240M
7	**Shell Oil Co.** Houston 33,184	98	9,925	$20,852M	$1,230M	$200M
8	**Tenneco, Inc.** Houston 102,500	111	9,565	$15,075M	-$218M	$240M

research and analysis, computerized resources are all the more important.

Significantly, Amoco's subsidiaries — not internal information systems — are driving the demand for technology resources and tools. The subsidiaries' demand for systems services is also attributable to the industry's overall recent earnings patterns. At Amoco, as at its competitors, earnings from upstream exploration and production rebounded strongly in 1987 — a 300% increase over 1986.

Downstream refining, marketing and transportation earnings, which fell by 40% in 1987, earned $206 million in this year's second quarter, compared with $55 million in the same period last year.

So in information systems terms, Amoco is a bull market. Precisely because the demand for support is so widespread throughout the corporation, Reid insists on a highly centralized systems operation to oversee a diverse information technology project base.

An estimated 70% of Amoco's information systems spending occurs through Reid's parent company budget, with the remainder funded through smaller installations at refineries, chemical plants and research facilities.

In the broadest sense, Amoco is using technology to support the restructuring of its main upstream operating subsidiary, Amoco Production Co., which searches for and produces crude oil and natural gas worldwide and eats nearly 50% of Reid's charge-out budget.

This restructuring effort involves integrating and revamping the production revenue accounting area and its database structures.

Amoco Production is also upgrading the technology associated with actual production operations to improve profitability by applying a wide range of advanced technologies, including engineering workstations, high-resolution graphics and software for optimizing the flow of products through gas plants, and monitoring field operations.

In the downstream business, most technology activity centers on one of two large operating subsidiaries, Amoco Oil Co. (the other is Amoco Chemical Co.), which manufactures, transports and markets petroleum products and consumes about 25% of Reid's information systems charge-out budget.

Given Amoco's range of competitive cost-containment and productivity-boosting technology initiatives and its impressive performance as the industry's earnings leader in the first half of 1988, Morrow's claim that the company is positioned to maintain "profitable growth in an uncertain environment" has a ring of truth.

Certainly for the company to meet its long-term earnings growth objective of 8% to 10% per year, information technology can only increase in strategic importance. Reid notes, "I cannot envision a scenario that would cause us to hold flat or decrease information systems spending."

Ultimately, Amoco's success in developing and applying technology solutions to business problems may hinge on a comparatively simple managerial dictum. As Reid puts it, "Information is a commodity. Those who have a lot of it and can rely on it ought to be able to make better business decisions. We must, therefore, invest in systems that make data available to all who need it."

Bernstein is managing director of Gavroche Associates, a communications consulting firm in Cambridge, Mass.

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Dave Evans, Penney's systems chief

J. C. PENNEY PROVES ITSELF A SMART SYSTEMS SHOPPER

By Connie Winkler

Any bargain hunter knows you get your money's worth at J. C. Penney Co. Likewise, the company's information systems are the result of investments that provide good value for the dollar.

In other industries, such a philosophy is hardly a qualification for leadership; however, in the retailing arena, where systems investments hover at approximately 1% of revenue, Penney's systems use ranks at the top of the industry in the *Computerworld Premier 100.* The company annually invests almost 1.5% of its $15 billion revenue in information systems.

Penney's no-nonsense philosophy, which hearkens back to the days of founder James Cash Penney, allows the company to make the most of technology to operate 1,400 retail stores nationwide. Information systems support contributes to a $608 million profit, which increased 12% last year. Profits grew 25% the previous year, making up for declines in 1983 and 1984.

"In the past 20 years, we've seen retailing exploit technology more, and we were on the leading edge," says Dave Evans, vice-president of systems and data processing. "Retailing in general was not as early to exploit computers as insurance and financial services."

Evans took the information systems helm earlier this year when Penney's headquarters moved out of New York's midtown Manhattan to Plano, Texas, outside Dallas. The firm's technological claims to fame include the following:

- Running one of the most sophisticated and far-flung IBM Systems Network Architecture networks.
- Using and promoting electronic data interchange (EDI) as much as or more than competitors.
- Processing its merchandise with optical character recognition tags.
- Shipping catalog orders "faster than any other big guys do."

Charge it

The best example of Penney's extracting the most value from its investment is the company's credit card authorization network, which is one aspect of a corporatewide network installed in the mid-1970s. Today, the network connects approximately 40,000 in-store point-of-sale terminals.

Penney's customers like credit cards: Almost 60% of the company's $15 billion annual sales are from credit, primarily Penney's own cards but also bank cards and American Express.

"Credit authorization became a competitive advantage," Evans says.

About five years ago, Penney realized other retailers, also scattered throughout the U.S., might need fast, accurate credit authorizations. The company formed a separate subsidiary, J. C. Penney System Services, Inc., to offer this service to these retailers.

Oil companies with service station chains, such as Sunoco, Amoco, Shell and Unocal, snapped up the offer. The system processes authorizations that travel from the service station to the nearby Penney's store and then to Tandem TXP-class transaction processing systems at three of the company's six data centers.

Lately, other smaller retailers and several Utah banks have been added to the authorization network. Currently, the network handles 350 million Penney authorizations and 300 million others annually, with Penney's own security software guarding network access.

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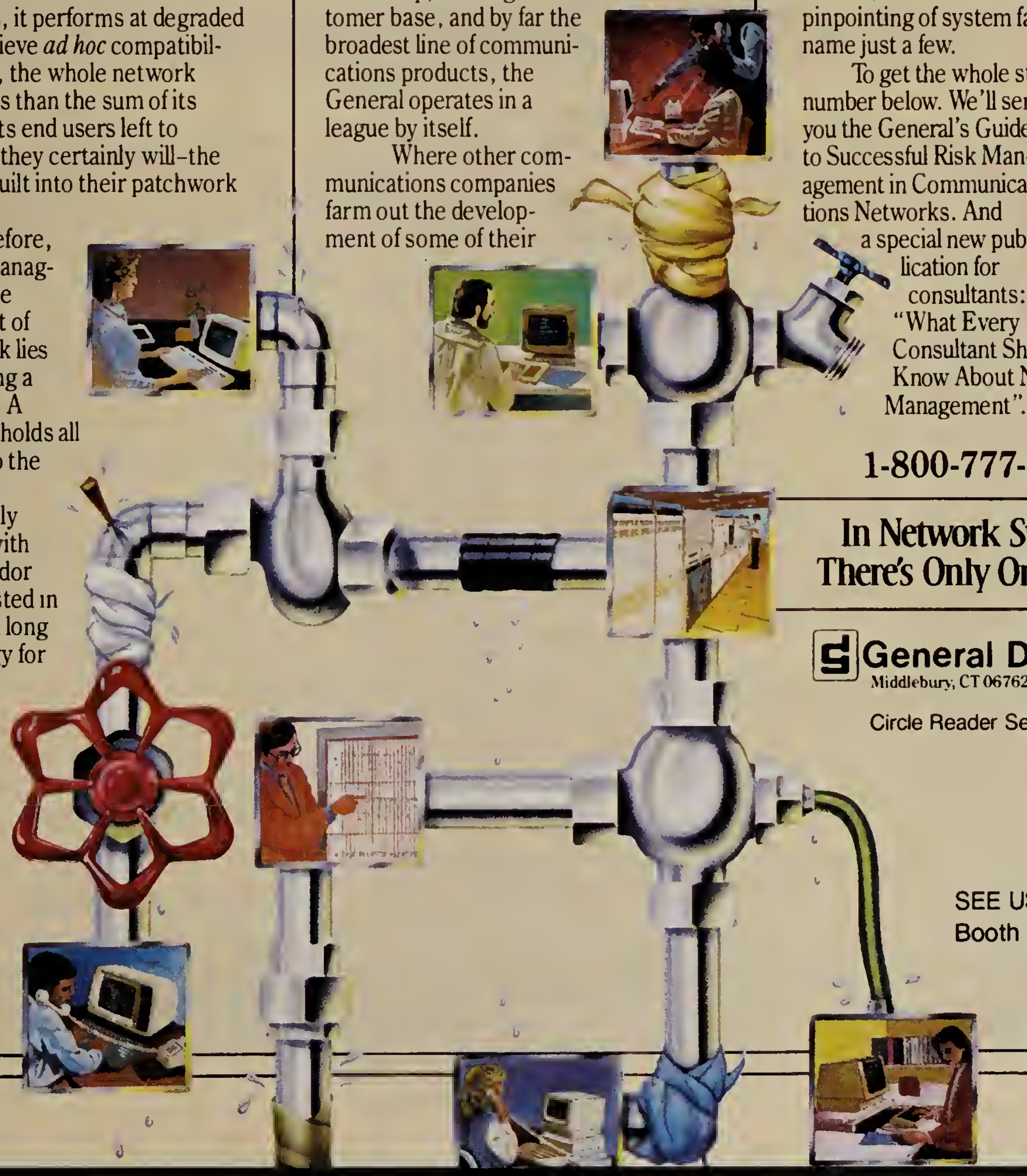

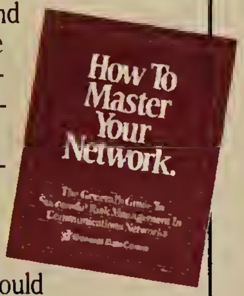
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handling the billing processing and electronic messaging for several of the gasoline company clients.

"Management is spurring us on to do more things," says Gerry Monday, manager of corporate systems services and data processing. "The key is to move from operational things — creating tickets for warehousing or writing payroll checks, for instance — to getting information about competitive decisions."

Speed is not the issue

This effort stands in sharp contrast with the last decade, at which time the push was to collapse the time in the order processing cycle.

"The requirement to get it quickly has become less important," Monday says. "As we get more information about items, we may be able to do some real sales forecasting" — which can be a distinct competitive advantage.

Some of that forecasting may be done on expert systems-like applications running on the personal computer local-area networks Penney is installing in buildings on its Plano campus.

Early sales forecasting would address the proverbial problems of too many stylish swimsuits in September or "dog merchandise" — clothes that no one wants at anytime of the year.

Penney's EDI network was installed in the early 1980s, and the company sends its own EDI manual to its 200 largest suppliers who download orders each night. Penney promises to adopt the coming American National Standards Institute standard and will also begin electronic payments as those standards emerge.

Sales forecasting may be done by expert systems.

"We've learned how to network within our own company over the last 10 years; now it's time to learn how to network between companies," Evans says.

Penney also uses EDI in its ambitious internal television programming. Corporate merchandise buyers broadcast their selections to more than 300 buyers who sit at computers and individually select the fashions they believe will sell in their region — within their budget and sales projections. Their selections are sent to the suppliers electronically. Penney uses a satellite-based Private Television Network for the broadcasts and now operates three studios in Dallas.

Another technology-based ordering operation is Penney's catalog sales, which applies electronically premarked merchandise to its catalog ordering and inventory.

"It's a convenience business," Evans says about the catalog operations. "We make it convenient to order, pay and receive the goods." Penney provides catalog service within 48 hours to 70% of the country.

Winkler, former New York bureau chief for Computerworld, *writes about information strategies and management technology.*

RETAILING

Industry Rank	Company/Location/Total employees	Premier 100 rank	Total score	1987 revenue	1987 profits	Estimated IS budget
1	**J. C. Penney Co.** Dallas 178,500	67	10,705	$15,332M	$608M	$225M
2	**Sears Roebuck and Co.** Chicago 493,200	74	10,510	$48,440M	$1,498.9M	$600M
3	**Carter Hawley Hale Stores, Inc.** Anaheim, Calif. 35,000	76	10,465	$2,641M	-$115.3M	$40M
4	**Dayton-Hudson Corp.** Minneapolis 130,500	136	8,860	$10,677M	$228.5M	$200M
5	**McDonald's Corp.** Oak Brook, Ill. 159,000	145	8,540	$4,893.5M	$596.5M	$60M
6	**Federated Department Stores** Cincinnati 135,300	148	8,505	$11,118M	$313M	$200M
7	**The May Department Stores Co.** St. Louis 147,400	169	7,840	$10,314M	$444M	$100M
8	**Wal-Mart Stores, Inc.** Bentonville, Ar. 183,000	172	7,635	$15,959.3M	$627.6M	$150M
9	**The Kroger Co.** Cincinnati 170,000	176	7,560	$17,659.7M	$246.6M	$150M
10	**K Mart Corp.** Troy, Mich. 325,000	192	6,820	$25,864M	$692.2M	$125M

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7. Rebind plan	
8. Inform CICS	
9. Test	

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Circle Reader Service Number 30

Systems move from an expense to a must in retail

By Sheryl Kay

Sears Roebuck vs. **J. C. Penney.** Macy's vs. Bloomingdale's. **McDonald's** vs. Burger King. Rivalries dominate retail whether the merchandise is appliances, clothing or fast food.

Yet, because retailers are playing catch-up with other industries in using information technology, they are putting aside their competitive struggles to come together on one mutually beneficial project.

Retailers are joining forces to examine how they can best use technology. The symbol of this cooperative effort is the 2-year-old Voluntary Interindustry Communications Standards (VICS) group.

An ad hoc team of retailers, apparel manufacturers and suppliers work together to establish standards to meet the members' business goals. In addition, VICS recently commissioned Big Eight consulting firm Arthur Andersen & Co. to do a cost-benefit analysis on new technologies in retailing.

The findings will be presented in January 1989 at the Annual National Retail Merchants Association convention in New York, according to Phil Dolen, a consulting practice partner at Arthur Andersen.

Keeping up with the Joneses

"The focus of MIS in retailing today," Dolen explains, "is to reduce the stores' purchasing and replenishment cycle in order to bring what is purchased more in line with trends."

Specific technology used for these purposes, Dolen says, includes bar coding so that every item will bear a unique identification and scanning in order to capture that information with low error rates.

"Leaders in that area include **Wal-Mart, K Mart** and **Dayton-Hudson**," he says.

These companies are among the *Computerworld Premier 100* top 10 in retail. Together the 10 companies spend an average of 1.24% of their revenue on information systems — a low average when compared with 4.9% in banking and 4% in transportation and other services.

P. CHARLES LADOUCEUR

Retailers are awakening to the value of technology

Systems expenditures are increasing, according to industry analysts, as retailers change their attitudes about the usefulness of technology.

A few years ago, small regional chains dominated the industry. The companies worked on extremely tight margins, and the business philosophy was operations oriented, with the major thrust to streamline delivery of services.

In that light, "MIS was looked upon as an expense item, generally to improve the operation of the retailer," says Glenn Mangurian, a vice-president at Index Group, Inc. in Cambridge, Mass.

Recently, however, the industry has gone through a major transition, with leading companies operating hundreds of outlets across the country.

This change in operating environment demands an upgrade in the role of MIS.

"MIS is allowing the retail executive to know what is happening in his 100 stores, like he used to know in his one store," Dolen observes.

Major marketing tool

"The emphasis is now on using information technology as more of a marketing tool for the merchandising and the buying functions," Mangurian says.

For example, Kathy Spangenberg, director of systems and programming at Mervyn's, one of Dayton-Hudson's operating companies, is responsible for tracking customer interests.

"We are very sensitive to their demands," Spangenberg says, "so we must evaluate the customer's preferences in a very short time frame. It just can't be done manually."

Spangenberg's group provides data on how often customers come into the stores, how long they stay, in which departments they make their purchases and, perhaps most importantly, what it is exactly that a customer purchases — right down to size, color and description.

This information is valuable in determining what merchandise retailers should carry, when they should have it in stock and to whom they should market it.

"Now we are viewed not as an expense but as a strategic investment," Spangenberg says.

THE PREMIER 100 (ALPHABETICALLY) WITH OVERALL RANK

Abbott Laboratories, 7
AMR (American Airlines), 18
American Cyanamid Co., 37
American Express Co., 51
American International Group, 95
American Standard, Inc., 93
Amoco Corp., 40
AT&T, 17
Atlantic Richfield Co., 83
Banc One Corp., 24
Bankamerica Corp., 46
Baxter Healthcare Corp., 11
Bell Atlantic Corp., 8
Bellsouth Corp., 81
The Boeing Co., 91
Burlington Industries, Inc., 77
Capital Cities/ABC, 88
Carter Hawley Hale Stores, Inc., 76
Caterpillar, Inc., 41
CBS, Inc., 58
Citicorp, 54
The Coca-Cola Co., 84
Contel Corp., 28
Corestates Financial Corp., 49
Corning Glass Works, 42
Deere & Co., 32
Dow Chemical Co., 13
Duke Power Co., 66
Dun & Bradstreet Corp., 63
E. I. Du Pont De Nemours and Co., 52
Eastman Kodak Co., 19
Farmers Group, Inc., 82
Federal Express Corp., 61
First Chicago Corp., 72
First Union Corp., 57
First Wachovia Corp., 97
Ford Motor Co., 86
Gencorp, Inc., 25
General Dynamics Corp., 90
General Electric Co., 38
General Mills, Inc., 100
General Motors Corp., 96
General Signal Corp., 33
Georgia-Pacific Corp., 35
Gillette Co., 6
Goodyear Tire & Rubber Co., 27
GTE Corp., 20
Home Federal Savings & Loan, 70
International Paper Co., 26
J. C. Penney Co., 67
Johnson & Johnson, 71
Litton Industries, 99
The Lockheed Corp., 14
Manufacturers Hanover Corp., 85
McDonnell Douglas Corp., 9
MCI Communications Corp., 10
McGraw-Hill, Inc., 12
The Mead Corp., 16
Merck & Co., 21
Metropolitan Life Ins. Co., 43
Middle South Utilities, Inc., 55
Minnesota Mining & Mfg, Co., 78
Monsanto Co., 59
Mutual Benefit Life Ins. Co., 68
Nationwide Mutual Ins. Co., 30
New York Life Insurance Co., 23
Northeast Utilities, 1
Northrop Corp., 3
Norwest Corp., 29
Owens-Illinois, Inc., 15
Pacific Gas and Electric Co., 92
Pennzoil Co., 73
Pepsico, Inc., 79
Pfizer, Inc., 36
Polaroid Corp., 2
PPG Industries, Inc., 94
Primerica Corp., 65
Reynolds Metals Co., 62
RJR Nabisco, Inc., 75
Rockwell International Corp., 34
Salomon, Inc., 87
Sara Lee Corp., 50
Sears Roebuck and Co., 74
Shell Oil Co., 98
Smith Kline Beckman Corp., 39
Southern Company Services, Inc., 47
Southwestern Bell Corp., 5
St. Paul Companies, Inc., 80
Sun Co., 64
Teachers Ins. & Annuity Assn., 45
Teledyne, Inc., 89
Texas Utilities Co., 22
Textron, Inc., 31
Time, Inc., 60
The Travelers Corp., 4
Unocal Corp., 48
Union Carbide Corp., 69
United Technologies Corp., 44
USX Corp., 56
Wickes Companies, 53

Once the information is gathered, it must be "tagged" to that customer, analyzed and then followed up. Index Group's Mangurian relates a favorite industry example of the pregnant woman who went into Sears and purchased maternity clothes with her credit card.

"In the next month's bill, a small brochure would be enclosed for that woman, describing all of Sears' baby furniture," Mangurian says.

Credit cards used to be the traditional way to track customer purhases. Today, sophisticated point-of-sale systems do it.

Credit cards used to be the way to track purchases. Today, sophisticated point-of-sale systems do it.

"Now retailers such as Sears and Penney's are experimenting with preferred-customer cards, check cashing cards and other ways of identifying who the customer is at the point of sale," Mangurian says.

Some companies offer incentives to customers who use that store's means of identification.

Telecommunications technology is also critical in retail, particularly as a control vehicle for those retail chains with many widely scattered outlets.

The importance of communications also extends beyond the retailer's own walls. The desire to minimize paperwork is causing retailers to make demands on their suppliers to implement electronic data interchange (EDI). The sending and receiving of orders, payments and invoicing is moving from paper to EDI.

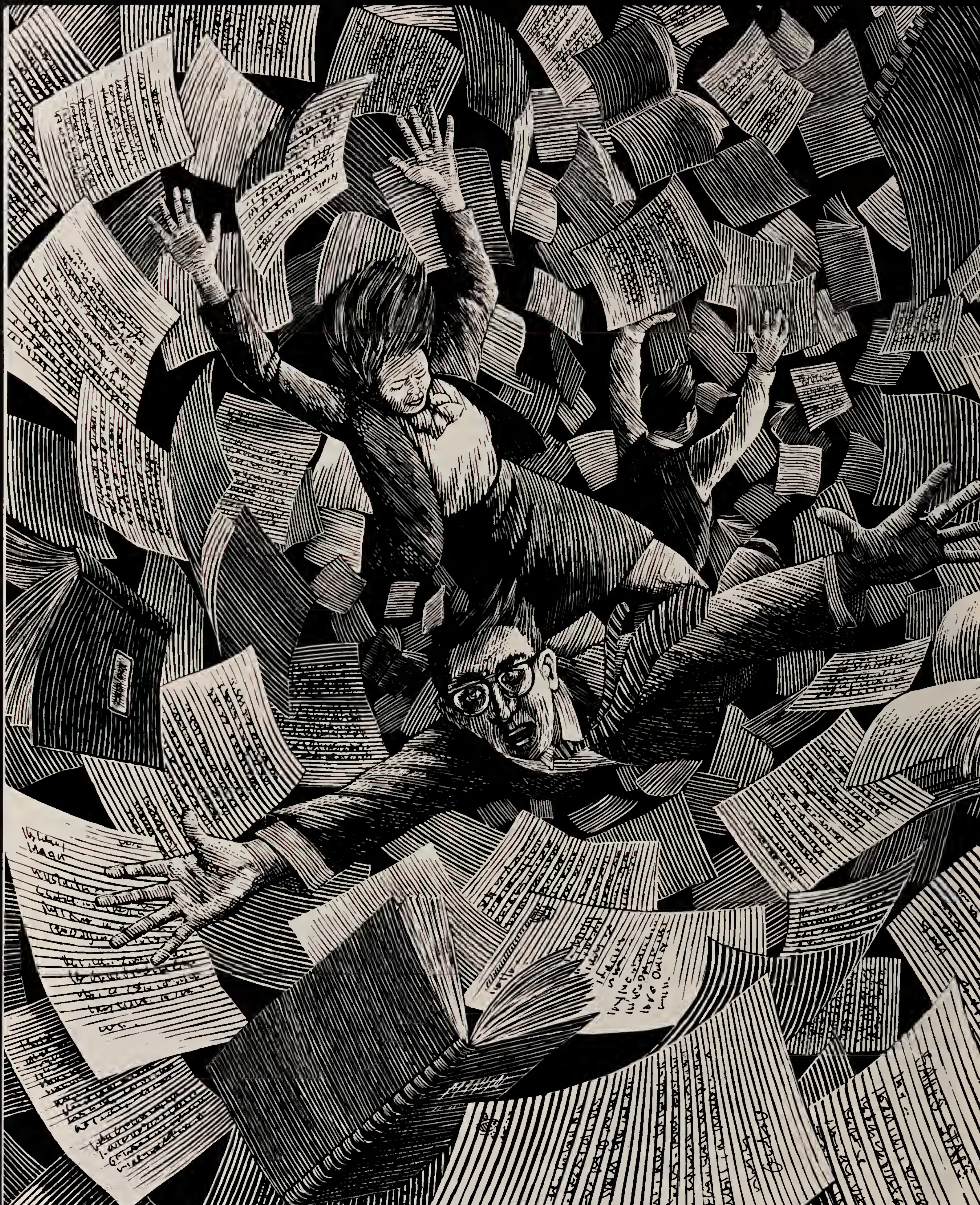
Although many retailers continue to use third-party vendors such as General Electric Co.'s Information Services and IBM, others — such as K Mart — are moving toward creating their own EDI systems, Mangurian notes.

Relative to other industries, some may still consider the MIS department's visibility in retailing to be low. Few top MIS executives actually report to the chairman of the board at retail companies.

Nevertheless, retailers are starting to move ahead in technology. Some companies are even currently experimenting with expert systems.

Retailers may not be ready to use such systems to predict the popularity of the miniskirt or the maxiskirt for 1989; however, they will help managers make decisions about inventory.

Kay is a Tampa, Fla.-based business consultant and free-lance writer.



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Circle Reader Service Number 31

HOW TO CALCULATE YOUR COMPANY'S RANKING

FORMULAS:

To calculate where your company would rank among the Premier 100, use the following formulas:

INSTALLED VALUE

Total current market value of installed equipment: ______

STEP 1 — DIVIDE BY
current revenue: ______

STEP 2 — MULTIPLY BY 100

STEP 3 — Assign the points associated with the range that corresponds to your answer:

0.01 to 0.47 — 30 points; 0.48 to 0.96 — 70 points; 0.97 to 2.2 — 120 points; 2.3 to 3.17 — 140 points; 3.17 to 7 — 150 points; more than 7 — 175 points.

STEP 4 — MULTIPLY BY 15. This is your total score for Installed Value.

ESTIMATED BUDGET

Estimated annual MIS/DP budget for corporation: ______

STEP 1 — DIVIDE BY
current revenue: ______

STEP 2 — MULTIPLY BY 100

STEP 3 — Subtract from the percentage that corresponds to your industry:

Aerospace — 1.4; Chemical — 1.2; Consumer products — 1.5; Electronics — 1.4; Food and beverage — 0.8; Health and pharmaceutical — 1.2; Industrial and auto manufacture — 1.0; Metal and metal products — 1.2; Petroleum and petrochemical — 0.68; Other process industries — 0.68; Banking — 4.5; Life insurance — 1.7; Other insurance and financial services — 3.1; Utilities — 1.3; Retail — 1.0

STEP 4 — Assign the points associated with the range that corresponds to your answer:

-4 to -2 — 50 points; -1 to 0.05 — 70 points; 0.06 to 0.60 — 100 points; 0.60 to 2 — 130 points; 2.1 to 2.85 — 140; 2.85 to 6 — 150 points; more than 6 — 175 points.

STEP 5 — MULTIPLY BY 30. This is your total score for Estimated Budget.

PROFIT

STEP 1 — Calculate your corporation's average profit growth over five years (1983 to 1987). If you show negative profits for any year, mark zero points for this category.

STEP 2 — Assign the points associated with the range that corresponds to your answer:

-4 to -2 — 50 points; -1 to 0.05 — 70 points; 0.06 to 0.60 — 100 points; 0.60 to 2 — 130 points; 2.1 to 2.85 — 140; 2.85 to 6 — 150 points; more than 6 — 200 points.

STEP 3 — MULTIPLY BY 15. This is your total score for Profit.

STAFF

STEP 1 — Calculate percentage of current MIS/DP budget spent on staff: ______

STEP 2 — Assign the points associated with the range that corresponds to your answer:

70 to 50 — 70 points; 51 to 40 — 100 points; 41 to 35 — 150 points; 36 to 20 — 170 points; less than 20 — 200 points.

STEP 3 — MULTIPLY BY 15. This is your total score for Staff.

TRAINING

STEP 1 — Calculate percentage of current MIS/DP budget spent on training and education: ______

STEP 2 — Assign the points associated with the range that corresponds to your answer:

70 to 50 — 70 points; 51 to 40 — 100 points; 41 to 35 — 150 points; 36 to 20 — 170 points; less than 20 — 200 points.

STEP 3 — MULTIPLY BY 15. This is your total score for Training.

PCs AND TERMINALS

Total number of personal computers and terminals: ______

STEP 1 — DIVIDED BY
Total corporate employees: ______

STEP 2 — Assign the points associated with the range that corresponds to your answer:

70 to 50 — 70 points; 51 to 40 — 100 points; 41 to 35 — 150 points; 36 to 20 — 170 points; less than 20 — 200 points.

STEP 3 — MULTIPLY BY 15. This is your total score for Personal Computers and Terminals.

FINAL SCORE

ADD POINT TOTALS FROM Value, Budget, Profit, Staff, Training and PCs and Terminals. This is your CW 100 score. Send this information to Mike Sullivan-Trainor, Special Projects Editor, *Computerworld*, 375 Cochituate Road, Framingham, Mass. 01701 to be ranked on next year's list.

FOOTNOTES TO THE 100

Companies with multiple industry affiliations are placed in one of the following categories based on the industry from which they receive the greatest revenue — Aerospace, automotive and industrial; Banking; Chemicals; Equipment and material manufacture; Food, pharmaceuticals and consumer products; Insurance and financial services; Petroleum products; Retailing; Transportation, communication and other services; and Utilities.

Industry average spending on information systems is derived from annual consultant surveys and the average spending of the Premier 100 industry segment.

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